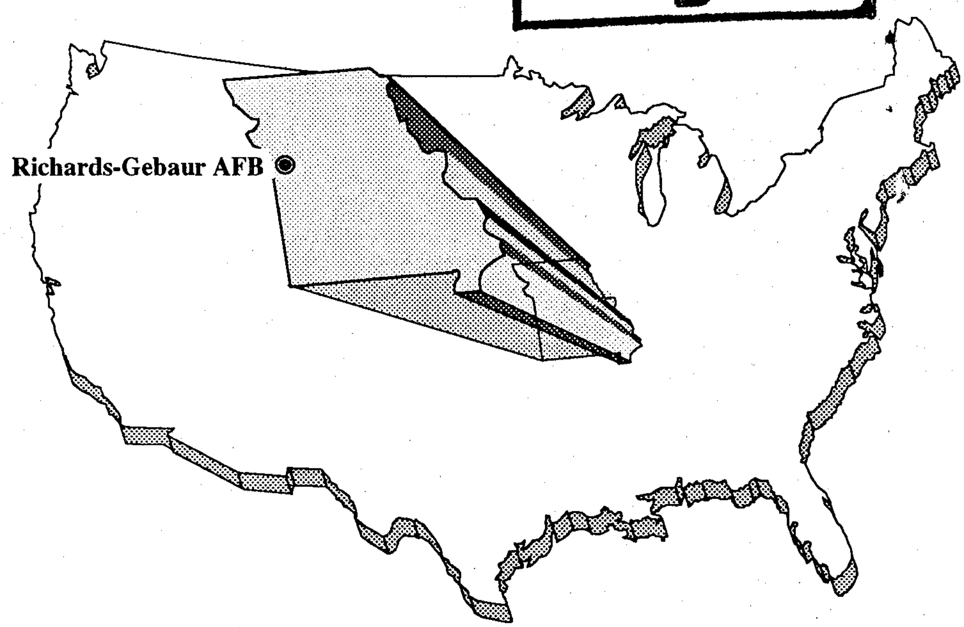
FINAL
ENVIRONMENTAL IMPACT STATEMENT
July 1994



DISPOSAL AND REUSE OF RICHARDS-GEBAUR AIR FORCE BASE, MISSOURI

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13. ABSTRACT (*Maximum 200 Words*)

Pursuant to the Defense Base Closure and Realignment Act of 1990, Richards-Gebaur Air Force Base is scheduled for realignment on September 30, 1994. This EIS, prepared in accordance with the National Environmental Policy Act, analyzes potential environmental impacts of disposal. Although disposal will have few direct effects, future use by others will create indirect effects. The document includes analyses of potential impacts a range of reasonable foreseeable reuses could have on local land use and aesthetics, transportation, utilities, hazardous materials/wastes, geology and soils, water resources, air quality, noise, biological resources, and cultural resources. All reuse alternatives, including the Proposed Action and the No-Action Alternative, incorporate aviation and industrial land use areas. Potential impacts associated with the Proposed Action include increase air emissions, wetlands impacts and one building eligible for the National Register of Historic Places. Preservation covenant within the disposal documents could eliminate or reduce these effects to a non-adverse level. Because the Air Force is disposing of the property, some of the mitigation measures are beyond Air Force control. Remediation of Installation Restoration Program sites will continue to be the responsibility of the Air Force.

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FINAL

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DISPOSAL AND REUSE OF RICHARDS-GEBAUR AIR FORCE BASE, MISSOURI

JULY 1994

COVER SHEET
FINAL ENVIRONMENTAL IMPACT STATEMENT
DISPOSAL AND REUSE OF RICHARDS-GEBAUR AIR FORCE BASE, MISSOURI

a. Responsible Agency: U.S. Air Force

b. Cooperating Agency: Federal Aviation Administration

c. Proposed Action: Disposal and Reuse of Richards-Gebaur Air Force Base (AFB), Jackson and Cass Counties, Missouri

d. Inquiries on this document may be directed to: Mr. Jonathon D. Farthing, Chief, Environmental Analysis Division, HQ AFCEE/ECA, 8106 Chennault Road, Brooks AFB, Texas, 78235-5318, (210) 536-3787

e. Designation: Final Environmental Impact Statement (FEIS)

f: Abstract: Pursuant to the Defense Base Closure and Realignment Act, Richards-Gebaur AFB is scheduled to be closed in September 1994. This FEIS has been prepared in accordance with the National Environmental Policy Act to analyze the potential environmental consequences of the disposal and reasonable alternatives for reuse of the base. The document includes analyses of local community, land use and aesthetics, transportation, utilities, hazardous materials/wastes, geology and soils, water resources, air quality, noise, biological resources, and cultural resources. The Proposed Action would include general aviation, cargo, commuter, maintenance, flight training, and military transient activities at the airfield, as well as developing industrial, office/industrial park, commercial, and military uses of base property. Three alternatives were also examined: an Aviation Alternative that features general aviation, maintenance, cargo, commuter, and pilot training operations; an Aviation with Mixed Use Alternative that proposes general aviation and private pilot training; and an Industrial Alternative that includes a small general aviation airport and a large industrial component. Each alternative also includes mixed non-aviation uses. A No-Action Alternative, which would entail no reuse of the base property, was also evaluated.

Potential environmental impacts for the Proposed Action and alternatives would include erosion effects during construction, increased air pollutant emissions, and possible adverse effects to biological and cultural resources. Short-term erosion effects on soils and surface water could occur locally during construction, but these could be mitigated by use of appropriate construction techniques. Special design considerations would be required because of unsuitable soils if septic tank systems were installed in the Belton Training Complex. Air pollutant emissions would increase over preclosure and closure amounts, but would still represent only a small fraction of total regional emissions and would not affect the attainment status of the region. Approximately 0.8 acre of wetlands in two parcels could potentially be affected by reuse activities; however, because these areas are along drainages that are topographically unsuitable for development, mitigation by avoidance would prevent impacts to the wetlands. One building that has been determined to be potentially eligible to the National Register of Historic Places could be adversely affected by conveyance from federal jurisdiction. Preservation covenants within the disposal documents could eliminate or reduce these effects to a non-adverse level. There would be no adverse environmental effects from the No-Action Alternative. Because the Air Force is disposing of the property, some of the mitigation measures are beyond the control of the Air Force. Remediation of hazardous waste sites under the Installation Restoration Program is, and will continue to be, the responsibility of the Air Force.

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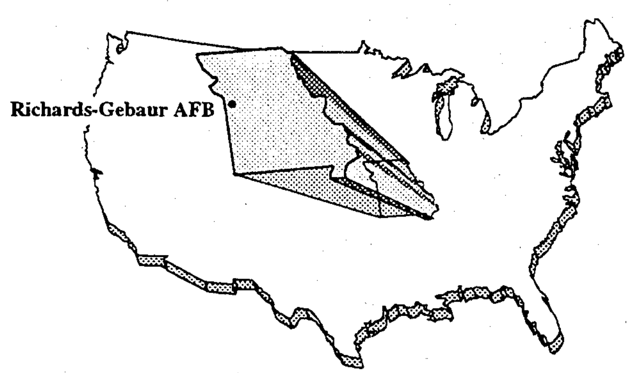

SUMMARY

SUMMARY

Richards-Gebaur Air Force Base (AFB), Missouri, was one of the bases recommended for closure by the 1991 Defense Base Closure and Realignment Commission. The Commission's recommendations were accepted by the President and submitted to Congress on July 12, 1991. As Congress did not disapprove the recommendations in the time given under the Defense Base Closure and Realignment Act (DBCRA) of 1990 (Public Law [P.L.] 101-510, Title XXIX), the recommendations have become law. Richards-Gebaur AFB will be closed on September 30, 1994.

The Air Force is required to comply with the National Environmental Policy Act (NEPA), 42 U.S. Code (U.S.C.) §§54321 et seq., in the implementation of base disposal and reuse. The Air Force must now make a series of interrelated decisions concerning the disposition of base property. This environmental impact statement (EIS) has been prepared to provide information on the potential environmental impacts resulting from the disposal and proposed reuse of the base property. The Federal Aviation Administration (FAA) is a cooperating agency in the preparation of this EIS, and will make decisions on its own and assist the Air Force in making related decisions concerning Richards-Gebaur AFB property. Several alternative reuse concepts are studied to identify the range of potential direct and indirect environmental consequences of disposal.

After completion and consideration of this EIS, the Air Force will prepare decision documents stating what property is excess and surplus, and the terms and conditions under which the dispositions will be made. These decisions may affect the environment by influencing the nature of the future use of the property.

PROPOSED ACTION AND ALTERNATIVES

In a previous disposal action in 1985, approximately 1,360 acres of Richards-Gebaur AFB property were conveyed to Kansas City. Richards-Gebaur AFB now consists of approximately 426 acres in 11 parcels. The Cantonment Area, covering 208 acres, is the largest parcel and contains the main aviation support and administration areas. Nine smaller parcels, ranging from 1 to 13 acres, surround the Cantonment Area. The Belton Training Complex, about 4 miles south of the Cantonment Area, encompasses 184 acres and is largely undeveloped.

The reuse alternatives developed for the environmental analysis include all 11 parcels of on-base property. Within this EIS, Air Force-owned property (comprising all 11 parcels) is discussed as on-base property. All other public and private property in the region will be referred to as off-base property.

Air Force policy is to encourage timely community reuse planning by offering to use the community's plan for reuse or development of land and facilities as the Air Force's proposed action in the EIS. The reuse plan presented by the Kansas City Aviation Department (KCAD), the officially designated reuse authority, has been adopted as the Proposed Action for environmental analysis.

Because the airfield is owned by the KCAD and is not part of Air Force property to be disposed, civilian operations at Richards-Gebaur Airport would continue under the No-Action Alternative. It is assumed that only the main runway would be used, as under preclosure and closure conditions. Civilian aircraft activity levels are expected to be similar to those projected at closure, and would probably increase over the next 20 years as a result of general growth in the region, even without the addition of Air Force property. Further, it would be difficult to project the difference in aviation operations growth with and without base disposal and reuse. For these reasons, and because the Air Force contribution to aviation operations (and associated environmental impacts) at Richards-Gebaur Airport has been small, it has been assumed for the purposes of this environmental analysis that all growth is associated with reuse, and impacts are analyzed for total (cumulative) projected aviation activities developed for the Proposed Action and three reasonable reuse scenarios.

In order to address the range of potential environmental impacts of disposal and reuse, three conceptual reuse alternatives have been developed, in addition to the Proposed Action and the No-Action Alternative:

- The **Proposed Action** combines continued support of airport operations with large areas set aside for office and industrial development. Aircraft operations would include general aviation, maintenance, commuter, cargo, and pilot training, as well as continuing military transients; total operations would reach 114,000 by 2014. The main runway would be used, and the crosswind runway would be activated if justified by demand. In addition to aviation support activities, the plan incorporates industrial, office/industrial park, and commercial land uses. Portions of the base would also be used by the U.S. Marine Corps and the U.S. Army.

- The **Aviation Alternative** centers around support for a mixed use airport with civilian aviation activities including general aviation, commuter, maintenance, pilot training, and air cargo components in addition to continuing transient military operations. Total flight operations would exceed 96,000 by 2014, using the main runway and reactivated crosswind runway. The plan incorporates aviation support, industrial, residential, and public facilities/recreation land uses.

- The **Aviation with Mixed Use Alternative** focuses on supporting a general aviation airport with more than 106,000 operations by 2014. Operations would include general aviation, pilot training, and military transient operations using a shortened main runway and reactivated, shortened crosswind runway. The major land uses proposed are aviation support, industrial, and public facilities/recreation. Institutional (educational) and commercial uses comprise smaller areas.

- The **Industrial Alternative** features extensive industrial development in addition to support for a small general aviation airport with approximately 76,000 operations, including military transients, by 2014. Only the main runway would be active. The remaining portions of the base would be redeveloped for institutional (medical and educational), commercial, residential, public facilities/recreation, and agricultural uses.

- The **No-Action Alternative** would result in the base being placed in caretaker status. Maintenance activities would take place on base and civilian aviation operations would continue at the airport.

SCOPE OF STUDY

The Notice of Intent to prepare an EIS for the disposal and reuse of Richards-Gebaur AFB was published in the Federal Register on October 9, 1991. Issues related to the disposal and reuse of Richards-Gebaur AFB were identified during an ensuing scoping period. A public scoping meeting was held on November 5, 1991, at the Grandview City Hall. The comments and concerns expressed at this meeting and in written correspondence received by the Air Force, as well as information from other sources, were used to determine the scope and direction of studies and analyses required to accomplish this EIS.

This EIS discusses the potential environmental impacts associated with the reuse alternatives, as well as with interim activities (e.g., interim outleases) that may be allowed by the Air Force before final disposal of the base. In order to establish the context in which these environmental impacts may occur, potential changes in population and employment, land use and aesthetics, transportation, and community and public utility services are discussed as reuse-related influencing factors. Issues related to current and future management of hazardous materials and wastes are also discussed. Potential impacts to the physical and natural environment are evaluated for geology and soils, water resources, air quality, noise, biological resources, and cultural resources. These impacts may occur as a direct result of disposal and reuse actions or as an indirect result of changes to the local communities.

The baseline against which the Proposed Action and alternatives are analyzed consists of the conditions projected at base closure in September 1994. Although the baseline assumes a closed base, a reference to preclosure conditions is provided in several sections (e.g., Air Quality, Noise) to allow a comparative analysis over time. This will assist the Air Force decision maker and other agencies that may be making decisions relating to disposal and reuse of Richards-Gebaur AFB in understanding potential long-term trends in comparison to historic conditions when the installation was active.

Concurrently with preparation of this EIS, the Air Force is conducting two other studies in support of the disposal and reuse of Richards-Gebaur AFB. The Environmental Baseline Survey (EBS) provides information on the condition of property to be disposed in compliance with the federal Community Environmental Response Facilitation Act (CERFA) (P.L. 102-42, 42 U.S.C. §9620[h]). An EBS is required by Department of Defense (DOD) policy before any property can be sold, leased, transferred, or acquired. The Socioeconomic Impact Analysis Study (U.S. Air Force, 1994) describes the socioeconomic effects of disposal and reuse on local communities. Population and employment projections developed for the socioeconomic study are used in this EIS.

SUMMARY OF ENVIRONMENTAL IMPACTS

This EIS considers environmental impacts of the Air Force's disposal of the installation and portrays a variety of potential land uses to cover reasonable future uses of the property and facilities by others. Several alternative scenarios were used to group reasonable land uses and to examine the environmental effects of likely reuse of Richards-Gebaur AFB.

Environmental impacts of the Proposed Action and reasonable alternatives are briefly described below. Influencing factors include projections of the reuse activities that would likely influence the biophysical environment, including ground disturbance, socioeconomic factors, and infrastructure demands, and are summarized in Table S-1. Impacts of the Proposed Action and reasonable alternatives over the 20-year study period are summarized in Table S-2. Generally, environmental impacts of reuse would be minor and very similar among all alternatives.

Mitigation. Options of mitigating potential environmental impacts that might result from the Air Force disposing of property or from the implementation of the Proposed Action or alternatives by property recipients are presented and discussed. Since most potential environmental impacts would result directly from reuse by others, the Air Force would not typically be responsible for implementing such mitigation. Full responsibility for suggested mitigation, therefore, would be borne primarily by future property recipients or local governmental agencies. Mitigation suggestions, where appropriate, are

Table S-1. Summary of Reuse-Related Influencing Factors

Factor	Proposed Action 1999	Proposed Action 2004	Proposed Action 2014	Aviation Alternative 1999	Aviation Alternative 2004	Aviation Alternative 2014	Aviation with Mixed Use Alternative 1999	Aviation with Mixed Use Alternative 2004	Aviation with Mixed Use Alternative 2014	Industrial Alternative 1999	Industrial Alternative 2004	Industrial Alternative 2014	No-Action Alternative[a]
Ground disturbance (acres by phase)	22	20	41	38	32	10	55	15	17	65	20	18	0
Aircraft operations (annual)	58,000	78,000	114,000	54,042	70,081	96,122	62,715	80,914	106,415	46,001	54,001	76,001	0
Direct employment	565	869	1,475	773	949	921	662	874	1,103	407	672	911	0
Local transfers	549	837	1,413	735	902	875	629	831	1,048	388	640	866	0
New jobs	16	32	62	38	47	46	33	43	55	19	32	45	0
Secondary employment	521	869	1,570	870	1,058	1,017	838	1,057	1,308	466	751	1,006	0
Local transfers	517	861	1,555	861	1,047	1,006	829	1,046	1,295	461	743	996	0
New jobs	4	8	15	9	11	11	9	11	13	5	8	10	0
Population In-migration	58	116	225	137	169	166	122	157	198	70	116	160	0
Traffic (total daily trips)	1,700	2,900	5,300	2,800	3,650	3,850	4,000	4,600	5,300	2,050	3,300	3,950	0
Increase in ROI water demand (MGD)	0.093	0.186	0.371	0.064	0.089	0.092	0.043	0.057	0.073	0.031	0.066	0.083	0
Increase in ROI wastewater production (MGD)	0.085	0.169	0.338	0.072	0.102	0.106	0.047	0.063	0.080	0.035	0.076	0.094	0
Increase in ROI solid waste generation (tons/day)	1.75	3.51	7.00	1.64	2.02	2.02	1.28	1.47	1.70	0.64	1.20	1.44	0
Increase in ROI electricity demand (MWH/day)	19.00	38.01	75.95	16.57	23.91	25.53	16.05	22.04	29.30	13.92	22.63	29.29	0
Increase in ROI natural gas demand (MMCF/day)	0.24	0.47	0.94	0.23	0.34	0.35	0.20	0.27	0.35	0.18	0.31	0.38	0

Note: (a) The No-Action Alternative values summarize influencing factors relative to the projected closure conditions for each period of analysis.
MGD = million gallons per day.
MMCF/day = million cubic feet per day.
MWH/day = megawatt-hours per day.
ROI = Region of Influence.

Table S-2. Summary of Environmental Impacts and Suggested Mitigations from the Reuse Alternatives
Page 1 of 5

Resource Category	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative	No-Action Alternative
Local Community					
• Land Use and Aesthetics	• **Impacts:** No impacts.	• **Impacts:** No impacts.	• **Impacts:** No impacts.	• **Impacts:** No impacts.	• **Impacts:** Potential conflict with regional development goals.
• Transportation	• **Impacts:** Reuse-related traffic increases would not result in unacceptable levels of service on local roadways. No airspace conflicts. Possible loss of commuter passenger service to Kansas City Downtown Airport.	• **Impacts:** Traffic increases similar to the Proposed Action. No airspace conflicts. Possible loss of commuter passenger service to Kansas City Downtown Airport.	• **Impacts:** Traffic increase similar to the Proposed Action. No airspace conflicts.	• **Impacts:** Traffic increase similar to the Proposed Action. No airspace conflicts.	• **Impacts:** Reduced LOS on regional and local roadways as a result of baseline population and employment growth.
• Utilities	• **Impacts:** Possible increase in quantities and types of industrial wastewater discharge.	• **Impacts:** Possible increase in quantities and types of industrial wastewater discharge. Belton Training Complex is not currently served by utilities. Extension of distribution lines, individual facility metering, and utility corridors and easements would be required for electrical and natural gas systems.	• **Impacts:** Similar to Aviation Alternative.	• **Impacts:** Similar to Aviation Alternative.	• **Impacts:** Disuse may result in degradation over the long term.
	• **Mitigations:** New users may have to provide pretreatment and obtain permits for industrial wastewater discharge.	• **Mitigations:** Pretreatment and permits may be required for industrial wastewater, similar to Proposed Action. Water, wastewater, and natural gas services would have to be provided at Belton Training Complex.	• **Mitigations:** Pretreatment and permits may be required for industrial wastewater, similar to Proposed Action. Water and wastewater services would have to be provided to Belton Training Complex.	• **Mitigations:** Pretreatment and permits may be required for industrial wastewater, similar to Proposed Action. Water would have to be provided to Belton Training Complex.	

LOS = level of service.

Table S-2. Summary of Environmental Impacts and Suggested Mitigations from the Reuse Alternatives
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Resource Category	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative	No-Action Alternative
Hazardous Materials and Hazardous Waste Management					
• Hazardous Materials Management	• **Impacts:** Moderate increase in types and quantities of materials. No impact with proper management.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Small quantities used by OL. No impact with proper management.
• Hazardous Waste Management	• **Impacts:** Moderate increase in types and quantities of wastes. No impact with proper management.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Small amounts generated by OL. No impact with proper management.
• Storage Tanks	• **Impacts:** No impact. All USTs to be removed. Aboveground tanks to be closed in place or managed according to applicable regulations.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** No impact. Tanks removed or properly closed.
• Asbestos	• **Impacts:** Removal and disposal of ACM in facilities to be demolished. Remaining asbestos will require management in place.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Continued management of facilities with ACM.
• Pesticide Usage	• **Impacts:** Moderate increase in use due to new development. No impact if managed in accordance with applicable regulations.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Minimal use by OL as part of caretaker activities. No impact.
• Polychlorinated Biphenyls (PCBs)	• **Impacts:** No impact. No regulated PCBs are on base.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** No impact. No regulated PCBs are on base.

ACM = asbestos-containing material.
OL = Operating Location.
PCB = polychlorinated biphenyl.
UST = underground storage tank.

Table S-2. Summary of Environmental Impacts and Suggested Mitigations from the Reuse Alternatives
Page 3 of 5

Resource Category	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative	No-Action Alternative
Hazardous Materials and Hazardous Waste Management (Continued)					
• Radon	• **Impacts:** Levels may exceed 4 pCi/l. Dormitories should be tested.	• **Impacts:** Levels may exceed 4 pCi/l. Dormitories should be tested. Residential construction design should incorporate features to reduce risk.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Aviation Alternative.	• **Impacts:** No impact.
• Medical/Biohazardous Waste	• **Impacts:** No impact. Small quantities generated by clinic.	• **Impacts:** No impact. None generated.	• **Impacts:** Same as Aviation Alternative.	• **Impacts:** Same as Proposed Action.	• **Impacts:** No impact. None generated.
• Ordnance	• **Impacts:** No impact. Ordnance removed from Weapons Bunker prior to closure. Soil contamination at Small Arms Range below action levels.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action. Reuse of Small Arms Range could cause lead contamination in soils.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.
• Lead-Based Paint	• **Impacts:** Possible exposure to lead-based paint in facilities built before 1978. • **Mitigations:** Disclose possible presence of lead-based paint to new owners.	• **Impacts:** Similar to Proposed Action. • **Mitigations:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action. • **Mitigations:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action. • **Mitigations:** Similar to Proposed Action.	• **Impacts:** No impacts. OL would maintain buildings with lead-based paint.
Natural Environment					
• Geology and Soils	• **Impacts:** Short-term soil erosion due to construction. No impacts to prime farmlands.	• **Impacts:** Severe restrictions in siting sanitary facilities due to unsuitable soils. Short-term soil erosion due to construction. Minimal level of consideration required for loss of prime farmland.	• **Impacts:** Minimal impact due to siting sanitary facilities in unsuitable soils. Short-term soil erosion due to construction. Minor impacts to prime farmland.	• **Impacts:** Short-term soil erosion due to construction. Beneficial impacts to farmlands.	• **Impacts:** No impacts.

OL = Operating Location.
pCi/l = picocuries per liter.

Table S-2. Summary of Environmental Impacts and Suggested Mitigations from the Reuse Alternatives

Resource Category	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative	No-Action Alternative
Natural Environment (Continued)					
	• **Mitigations:** Use techniques such as protective cover and diversion dikes to minimize erosion during and after construction.	• **Mitigations:** Use techniques such as protective cover and diversion dikes to minimize erosion during and after construction. Connect to sanitary sewer system or perform geologic and soil studies, and design facilities to optimize effectiveness of septic system while minimizing impacts.	• **Mitigations:** Similar to Aviation Alternative.	• **Mitigations:** Similar to Proposed Action.	
• Water Resources	• **Impacts:** Negligible increase in ROI water demand would not affect water supply. Minimal runoff effects.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** No impact.
• Air Quality	• **Impacts:** Increased regional and local emissions will not exceed NAAQS or PSD Class II standards.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Less than under reuse alternatives.
• Noise	• **Impacts:** No residents exposed to DNL 65 dB or greater from aircraft operations. No increase in number of people exposed to DNL 65 dB or greater from reuse-related surface traffic.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** No residents exposed to DNL 65 dB or greater from aircraft operations. Increase of 126 people exposed to DNL 65 dB or greater from surface traffic noise as a result of baseline growth in the ROI from 1994 to 2014.

dB = decibel.
DNL = day-night average noise level.
NAAQS = National Ambient Air Quality Standards.
PSD = Prevention of Significant Deterioration.
ROI = Region of Influence.

Table S-2. Summary of Environmental Impacts and Suggested Mitigations from the Reuse Alternatives
Page 5 of 5

Resource Category	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative	No-Action Alternative
Natural Environment (Continued)					
• Biological Resources	• **Impacts:** No threatened or endangered species. Possible impacts to 0.6 acre of jurisdictional wetlands along drainages.	• **Impacts:** No threatened or endangered species. Possible impacts to 0.8 acre of jurisdictional wetlands along drainages.	• **Impacts:** Similar to Aviation Alternative.	• **Impacts:** Similar to Aviation Alternative.	• **Impacts:** Potential increase in habitat value due to long-term decreases in human activity.
	• **Mitigations:** Avoid wetlands impacts through facility redesign, restrictions in transfer documents, and controlling runoff from construction sites.	• **Mitigations:** Similar to Proposed Action.	• **Mitigations:** Similar to Proposed Action.	• **Mitigations:** Similar to Proposed Action.	
• Cultural Resources	• **Impacts:** No prehistoric or historic archaeological, traditional, or paleontological sites are present. Potential impact to one historic property on base due to loss of federal protection.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Federal protection remains. The OL would continue Building 602 preservation maintenance.
	• **Mitigations:** Properties may be conveyed to nonfederal owners with preservation covenants. SHPO and Advisory Council would be consulted during development and implementation of procedures and mitigation strategies. Prepare agreement document to establish acceptable mitigation measures.	• **Mitigations:** Similar to Proposed Action.	• **Mitigations:** Similar to Proposed Action.	• **Mitigations:** Similar to Proposed Action.	

OL = Operating Location.
SHPO = State Historic Preservation Officer.

listed in terms of their potential effectiveness if implemented for affected resource areas and are summarized along with the environmental impacts of the Proposed Action and alternatives in Table S-2.

PROPOSED ACTION

Local Community. Redevelopment of base property under the Proposed Action would result in increases in employment and population in Jackson and Cass counties, Missouri, which together constitute the Region of Influence (ROI). Total ROI employment would increase from 482,927 at closure (1994) to 508,102 in 2014, compared to projected employment of 505,102 in 2014 without reuse. Population in the ROI would increase from 705,923 in 1994 to 734,441 in 2014 under this alternative, compared to 734,216 in 2014 without reuse. These increases would represent less than 1 percent of the projected growth in the area without base reuse, and the effects would be negligible.

The major changes in land use under the Proposed Action, compared to preclosure uses, would be an increase in aviation support and industrial uses; a decrease in commercial uses; and elimination of residential, institutional, public facilities/recreation, and vacant land uses. Military and office/industrial park uses would be created. Kansas City would have to revise its comprehensive plan and zoning ordinance to reflect the proposed uses, which would generally be compatible with surrounding uses. Belton would have to revise its zoning ordinance to allow industrial uses in the area currently zoned for agriculture.

Traffic on local roads would increase slightly over traffic projected without reuse, but effects on level of service on regional and local roads would be negligible. Levels of service on two local road segments would be lower than under the No-Action Alternative, but would still be at acceptable levels. Aviation operations would be similar to preclosure activity, and there would be no airspace conflicts. One possible impact to air transportation would be the loss of commuter service at Kansas City Downtown Airport as a result of increased services at Richards-Gebaur Airport; however, that loss of service would be mitigated by providing commuter service at Richards-Gebaur Airport.

Utility use associated with redevelopment of Richards-Gebaur AFB under the Proposed Action would represent an increase of less than 0.3 percent over projected consumption without reuse, which would be well within the capacity of local suppliers. Electrical and natural gas distribution systems would require expansion, metering of individual facilities, and establishment of utility corridors and easements.

Hazardous Materials and Hazardous Waste Management. The types of hazardous materials used and hazardous wastes generated under the

Proposed Action are expected to be similar to those during preclosure use. The quantities are expected to be greater than under the No-Action Alternative. The responsibility for managing hazardous materials and wastes would shift from a single user to multiple, independent users, which may degrade the capability of responding to hazardous materials and hazardous waste spills. The use of pesticides in developed areas would increase from closure conditions. It is assumed that adequate management procedures would be implemented, as required by applicable laws and regulations, to ensure proper use and handling of hazardous materials, hazardous wastes, and pesticides.

Reuse activities are not expected to affect the remediation of Installation Restoration Program (IRP) sites, which is proceeding according to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. §§9601 et seq., as amended. Remediation of the Air Force's IRP sites is, and will continue to be, the responsibility of the Air Force. Disposal and reuse of some Richards-Gebaur AFB properties may be delayed or limited by the extent and type of contamination at IRP sites and by current and future IRP remediation activities. Based on the results of IRP investigations, the Air Force may, where appropriate, place limits on reuse through deed restrictions on conveyances and use restrictions on leases.

Existing regulated underground storage tanks (USTs) will be removed by the Air Force prior to disposal. Aboveground storage tanks (ASTs) not identified for reuse would be closed in accordance with applicable regulations. All polychlorinated biphenyls (PCBs) and PCB-contaminated equipment under Air Force control have been removed from the base. Demolition or renovation of certain structures with asbestos-containing materials (ACM) would be the responsibility of the new owners and would be conducted in compliance with applicable Occupational Safety and Health Administration (OSHA) regulations and National Emissions Standards for Hazardous Air Pollutants (NESHAP).

Radon may be present at levels above 4 picocuries per liter (pCi/l), and the new owners of the dormitories in the Billeting Complex should perform radon testing before reuse to determine whether mitigation measures are necessary. All ordnance will be removed from the Weapons Bunker before base closure. Lead concentrations in the soil at the Small Arms Range are below regulatory action levels and no remedial action is necessary. Demolition or renovation of facilities may necessitate removal and disposal of lead-based paint; compliance with applicable federal, state, and local regulations would be the responsibility of the new owner. The potential presence of lead-based paint in facilities constructed before 1978 would be disclosed to new owners. Residential reuse of the dormitories could result in exposure to lead-based paint.

Small amounts of medical/biohazardous waste would be generated at the clinic. The new owners would be responsible for operation in compliance with Missouri regulations for the management of infectious wastes (10 Code of State Regulations [CSR] 80-7) to preclude impacts.

Natural Environment. There would be a potential for increased erosion and runoff effects associated with facility construction and demolition under the Proposed Action. Reuse-related increases in water use would represent less than 0.3 percent of ROI demand, and would present no impacts to the regional water supply.

The Proposed Action features the largest number of aviation operations. Air pollutant emissions would increase from closure conditions, but would remain below federal and state standards. Aircraft noise associated with Richards-Gebaur Airport operations would be less than that under preclosure conditions. No residents would be exposed to day-night average sound levels (DNL) of 65 decibels (dB) or greater from aircraft operations. There would be no increase in the number of residents exposed to DNL of 65 dB or greater due to surface traffic on local roads compared to the No-Action Alternative.

Impacts to biological resources would be minor. Ground disturbance associated with facility construction could have some short-term effects on wildlife habitat. There are no federally or state-listed threatened or endangered species known to occur on base property. There are several wetland areas totaling 0.6 acre in the Cantonment Area. Because these wetland areas are situated along natural drainages that are not suitable for development, impacts are unlikely. There is also 0.2 acre of wetlands in the Belton Training Complex; however, the continuation of Army Reserve training activities there would not result in impacts to wetlands.

Reuse of the base property would have few impacts on cultural resources. The Air Force has determined, and the Missouri State Historic Preservation Officer (SHPO) has concurred, that there are no archaeological resources on base property. One building has been identified as potentially eligible for the National Register of Historic Places (National Register). If the building is determined eligible, the Air Force would consult with the SHPO and the Advisory Council on Historic Preservation to identify appropriate mitigation measures, which could include placing preservation covenants in the conveyance documents or preparation of agreement documents.

AVIATION ALTERNATIVE

Local Community. Redevelopment of base property under the Aviation Alternative would result in increases in employment and population in the two-county ROI. Total ROI employment would increase from 482,927 at closure (1994) to 507,040 in 2014, compared to projected employment of

505,102 in 2014 without reuse. Population in the ROI would increase from 705,923 in 1994 to 734,382 in 2014 under this alternative, compared to 734,216 in 2014 without reuse. These increases would represent less than 1 percent of the projected growth in the area without base reuse, and the effects would be negligible.

The major changes in land use under the Aviation Alternative, compared to preclosure uses, would be an increase in aviation support, industrial, residential, and public facilities/recreation land uses, and elimination of institutional, commercial, and vacant land uses. Cass County would have to revise its comprehensive plan and zoning ordinance to reflect the proposed uses, which would generally be compatible with surrounding uses. Kansas City and Belton would have to revise their zoning ordinances to allow the proposed uses.

Traffic on local roads would increase slightly over traffic projected without reuse, but effects on level of service on regional and local roads would be negligible. Levels of service on two local road segments would be lower than under the No-Action Alternative, but would still be at acceptable levels. Aviation operations would be similar to preclosure activity, and there would be no airspace conflicts. One possible impact to air transportation would be the loss of commuter service at Kansas City Downtown Airport as a result of increased services at Richards-Gebaur Airport; however, that loss of service would be mitigated by providing commuter service at Richards-Gebaur Airport.

Utility use associated with redevelopment of Richards-Gebaur AFB under the Aviation Alternative would represent an increase of less than 0.1 percent over projected consumption without reuse, which would be well within the capacity of local suppliers. Electrical and natural gas distribution systems would require expansion, metering of individual facilities, and establishment of utility corridors and easements. Utility services would have to be provided to support the proposed residential development at the Belton Training Complex.

Hazardous Materials and Hazardous Waste Management. The types of hazardous materials used and hazardous wastes generated under the Aviation Alternative are expected to be similar to those present during preclosure use. The quantities are expected to be greater than under the No-Action Alternative. The responsibility for managing hazardous materials and wastes would shift from a single user to multiple, independent users, which may degrade the capability of responding to hazardous materials and hazardous waste spills. The use of pesticides in developed areas would increase from closure conditions. It is assumed that adequate management procedures would be implemented, as required by applicable laws and regulations, to ensure proper use and handling of hazardous materials, hazardous wastes, and pesticides.

Reuse activities are not expected to affect the remediation of IRP sites, which is proceeding according to CERCLA. Remediation of the Air Force's IRP sites is, and will continue to be, the responsibility of the Air Force. Disposal and reuse of some Richards-Gebaur AFB properties may be delayed or limited by the extent and type of contamination at IRP sites and by current and future IRP remediation activities. Based on the results of IRP investigations, the Air Force may, where appropriate, place limits on reuse through deed restrictions on conveyances and use restrictions on leases.

Existing regulated USTs will be removed by the Air Force prior to disposal. ASTs not identified for reuse would be closed in accordance with applicable regulations. All PCBs and PCB-contaminated equipment under Air Force control have been removed from the base. Demolition or renovation of certain structures with ACM would be the responsibility of the new owners and would be conducted in compliance with applicable OSHA regulations and NESHAP.

Radon may be present at levels above 4 pCi/l and should be considered in construction design of new residential structures to limit the potential for exposure. New owners of the dormitories in the Billeting Complex should perform radon testing before reuse to indicate if mitigation measures are necessary. All ordnance will be removed from the Weapons Bunker before base closure. Lead levels in soil at the Small Arms Range are below regulatory action levels and no remedial action is necessary. Demolition or renovation of facilities may necessitate removal and disposal of lead-based paint; compliance with applicable federal, state, and local regulations would be the responsibility of the new owner. The potential presence of lead-based paint in facilities constructed before 1978 would be disclosed to new owners. Residential reuse of the dormitories could result in exposure to lead-based paint.

Natural Environment. There would be a potential for increased erosion and runoff effects associated with facility construction and demolition under the Aviation Alternative. Soils in the Belton Training Complex are not suitable for septic tanks, and special design considerations would be required to provide wastewater services for the residential reuse to avoid impacts to soils. Reuse-related increases in water use would represent less than 0.1 percent of ROI demand, and would present no impacts to the regional water supply.

The Aviation Alternative features the largest number of aviation operations by large jets and, consequently, has generally higher air pollutant emissions and larger noise contours than the other alternatives. Air pollutant emissions would increase from preclosure and closure conditions, but would remain below federal and state standards. Aircraft noise associated with Richards-Gebaur Airport operations would be less than that under preclosure conditions. No residents would be exposed to DNL of 65 dB or greater from

aircraft operations. There would be no increase in the number of residents exposed to DNL of 65 dB or greater due to surface traffic on local roads compared to the No-Action Alternative.

Impacts to biological resources would be minor. Ground disturbance associated with facility construction could have some short-term effects on wildlife habitat. There are no federally or state-listed threatened or endangered species known to occur on base property. There are several wetland areas totaling 0.6 acre in the Cantonment Area and 0.2 acre in the Belton Training Complex. Because all of the wetland areas are situated along natural drainages that are not suitable for development, impacts are unlikely.

Reuse of the base property would have few impacts on cultural resources. The Air Force has determined, and the Missouri SHPO has concurred, that there are no archaeological resources on base property. One building has been identified as potentially eligible for the National Register. If the building is determined eligible, the Air Force would consult with the SHPO and the Advisory Council on Historic Preservation to identify appropriate mitigation measures, which could include placing preservation covenants in the conveyance documents or preparation of agreement documents.

AVIATION WITH MIXED USE ALTERNATIVE

Local Community. Redevelopment of base property under the Aviation with Mixed Use Alternative would result in increases in employment and population in the ROI. Total ROI employment would increase from 482,927 in 1994 to 507,513 in 2014, compared to projected employment of 505,102 in 2014 without reuse. Population in the ROI would increase from 705,923 in 1994 to 734,414 in 2014 under this alternative, compared to 734,216 in 2014 without reuse. These increases would represent less than 1 percent of the projected growth in the area without base reuse, and the effects would be negligible.

The major changes in land use resulting from the Aviation with Mixed Use Alternative, compared to those under preclosure, would be a decrease in aviation support, institutional (educational), and commercial land uses and an increase in industrial and public facilities/recreation uses; institutional (medical), residential, and vacant land would be eliminated. Kansas City and Belton would have to revise their comprehensive plans and Kansas City would have to revise its zoning ordinance, to reflect the proposed uses, which would generally be compatible with surrounding uses.

Traffic on local roads would increase slightly over traffic projected without reuse, but effects on level of service on regional and local roads would be negligible. Levels of service on two local road segments would be lower than under the No-Action Alternative, but would still be at acceptable levels.

Aviation operations would be similar to preclosure activity, and there would be no airspace conflicts.

Utility use associated with redevelopment of Richards-Gebaur AFB under the Aviation with Mixed Use Alternative would represent an increase of less than 0.1 percent over projected consumption without reuse, which would be well within the capacity of local suppliers. Electrical and natural gas distribution systems would require expansion, metering of individual facilities, and establishment of utility corridors and easements. Water and a septic system would have to be provided to support the proposed regional park at the Belton Training Complex.

Hazardous Materials and Hazardous Waste Management. The types of hazardous materials used and hazardous wastes generated under the Aviation with Mixed Use Alternative are expected to be similar to those present during preclosure use. The quantities are expected to be greater than under the No-Action Alternative. The responsibility for managing hazardous materials and wastes would shift from a single user to multiple, independent users, which may degrade the capability of responding to hazardous materials and hazardous waste spills. The use of pesticides in developed areas would increase from closure conditions. It is assumed that adequate management procedures would be implemented, as required by applicable laws and regulations, to ensure proper use and handling of hazardous materials and wastes and pesticides.

Reuse activities are not expected to affect the remediation of IRP sites, which is proceeding according to CERCLA. Remediation of the Air Force's IRP sites is, and will continue to be, the responsibility of the Air Force. Disposal and reuse of some Richards-Gebaur AFB properties may be delayed or limited by the extent and type of contamination at IRP sites and by current and future IRP remediation activities. Based on the results of IRP investigations, the Air Force may, where appropriate, place limits on reuse through deed restrictions on conveyances and use restrictions on leases.

Existing regulated USTs will be removed by the Air Force prior to disposal. ASTs not identified for reuse would be closed in accordance with applicable regulations. All PCBs and PCB-contaminated equipment under Air Force control have been removed from the base. Demolition or renovation of certain structures with ACM would be the responsibility of the new owners and would be conducted in compliance with applicable OSHA regulations and NESHAP.

Radon may be present at levels above 4 pCi/l, but no residential uses are proposed for on-base structures, so there would be no radon impacts. All ordnance will be removed from the Weapons Bunker before base closure. Lead levels in soil at the Small Arms Range are below regulatory action levels and no remedial action is necessary. If the Small Arms Range is

reused, appropriate maintenance procedures would be necessary to remove bullets regularly to prevent lead contamination of soils. Demolition or renovation of facilities may necessitate removal and disposal of lead-based paint; compliance with applicable federal, state, and local regulations would be the responsibility of the new owner. The potential presence of lead-based paint in facilities constructed before 1978 would be disclosed to new owners. Reuse of the dormitories as part of the institutional (educational) use could result in exposure to lead-based paint.

Natural Environment. There would be a potential for increased erosion and runoff effects associated with facility construction and demolition under the Aviation with Mixed Use Alternative. Soils at the Belton Training Complex are not suitable for septic tanks, but the requirement for a wastewater system to support the regional park would be minimal. Reuse-related increases in water use would represent less than 0.1 percent of ROI demand, and would present no impacts to the regional water supply.

Air pollutant emissions would increase from preclosure and closure conditions, but would remain below federal and state standards. Aircraft noise associated with Richards-Gebaur Airport operations would be less than that under preclosure and closure conditions. No residents would be exposed to DNL of 65 dB or greater from aircraft operations. There would be no increase in the number of residents exposed to DNL of 65 dB or greater due to surface traffic on local roads compared to the No-Action Alternative.

Impacts to biological resources would be minor. Ground disturbance associated with facility construction could have some short-term effects on wildlife habitat. There are no federally or state-listed threatened or endangered species known to occur on base property. There are several wetland areas totaling 0.6 acre in the Cantonment Area and 0.2 acre in the Belton Training Complex. Because all of the wetland areas are situated along natural drainages that are not suitable for development, impacts are unlikely.

Reuse of the base property would have few impacts on cultural resources. The Air Force has determined, and the Missouri SHPO has concurred, that there are no archaeological resources on base property. One building has been identified as potentially eligible for the National Register. If the building is determined eligible, the Air Force would consult with the SHPO and the Advisory Council on Historic Preservation to identify appropriate mitigation measures, which could include placing preservation covenants in the conveyance documents or preparation of agreement documents.

INDUSTRIAL ALTERNATIVE

Local Community. Redevelopment of base property under the Industrial Alternative would result in increases in employment and population in Jackson and Cass counties. Total ROI employment would increase from 482,927 in 1994 to 507,019 in 2014, compared to projected employment of 505,102 in 2014 without reuse. Population in the ROI would increase from 705,923 in 1994 to 734,376 in 2014 under this alternative, compared to 734,216 in 2014 without reuse. These increases would represent less than 1 percent of the projected growth in the area without base reuse, and the effects would be negligible.

Major land use changes under the Industrial Alternative, compared to those under preclosure, would include an increase in industrial, institutional (medical), and residential uses and a decrease in aviation support, institutional (educational), commercial, and public facilities/recreation uses. Vacant land would be eliminated and an agricultural use would be added at the Belton Training Complex. Kansas City and Belton would have to revise their comprehensive plans and zoning ordinances to reflect the proposed uses, which would generally be compatible with surrounding uses.

Traffic on local roads would increase slightly over traffic projected without reuse, but effects on level of service on regional and local roads would be negligible. Levels of service on two local road segments would be lower than under the No-Action Alternative, but would still be at acceptable levels. Aviation operations would be similar to preclosure activity, and there would be no airspace conflicts.

Utility use associated with redevelopment of Richards-Gebaur AFB under the Industrial Alternative would represent an increase of less than 0.1 percent over projected consumption without reuse, which would be well within the capacity of local suppliers. Electrical and natural gas distribution systems would require expansion, metering of individual facilities, and establishment of utility corridors and easements.

Hazardous Materials and Hazardous Waste Management. The types of hazardous materials used and hazardous wastes generated under the Industrial Alternative are expected to be similar to those present during preclosure use. The quantities are expected to be greater than under the No-Action Alternative. The responsibility for managing hazardous materials and wastes would shift from a single user to multiple, independent users, which may degrade the capability of responding to hazardous materials and hazardous waste spills. The use of pesticides in developed areas would increase from closure conditions. It is assumed that adequate management procedures would be implemented, as required by applicable laws and regulations, to ensure proper use and handling of hazardous materials and wastes and pesticides.

Reuse activities are not expected to affect the remediation of IRP sites, which is proceeding according to CERCLA. Remediation of the Air Force's IRP sites is, and will continue to be, the responsibility of the Air Force. Disposal and reuse of some Richards-Gebaur AFB properties may be delayed or limited by the extent and type of contamination at IRP sites and by current and future IRP remediation activities. Based on the results of IRP investigations, the Air Force may, where appropriate, place limits on reuse through deed restrictions on conveyances and use restrictions on leases.

Existing regulated USTs will be removed by the Air Force prior to disposal. ASTs not identified for reuse would be closed in accordance with applicable regulations. All PCBs and PCB-contaminated equipment under Air Force control have been removed from the base. Demolition or renovation of certain structures with ACM would be the responsibility of the new owners and would be conducted in compliance with applicable OSHA regulations and NESHAP.

Radon may be present at levels above 4 pCi/l, and should be considered in construction design of new residential structures to limit the potential for exposure. New owners of the dormitories in the Billeting Complex should perform radon testing before reuse to indicate if mitigation measures are necessary. All ordnance will be removed from the Weapons Bunker before base closure. Lead levels in soil at the Small Arms Range are below regulatory action levels and no remedial action is necessary. Demolition or renovation of facilities may necessitate removal and disposal of lead-based paint; compliance with applicable federal, state, and local regulations would be the responsibility of the new owner. The potential presence of lead-based paint in facilities constructed before 1978 would be disclosed to new owners. Residential reuse of the dormitories could result in exposure to lead-based paint.

Small amounts of medical/biohazardous waste would be generated at the clinic. The new owners would be responsible for operation in compliance with Missouri regulations for the management of infectious wastes (10 CSR 80-7) to preclude impacts.

Natural Environment. Overall, the Industrial Alternative would generate the largest amount of ground disturbance of all alternatives, primarily because of new development projected in the industrial use areas as well as initiation of agricultural activities in the Belton Training Complex. There would be a potential for increased erosion and runoff effects associated with facility construction and demolition. Reuse-related increases in water use would represent less than 0.1 percent of ROI demand, and would present no impacts to the regional water supply.

Air pollutant emissions would increase from closure conditions, but would remain below federal and state standards. Aircraft noise associated with

Richards-Gebaur Airport operations would be less than that under preclosure and closure conditions, as a result of FAA requirements for noise reductions on civilian jet aircraft. No residents would be exposed to DNL of 65 dB or greater from aircraft operations. There would be no increase in the number of residents exposed to DNL of 65 dB or greater due to surface traffic on local roads compared to the No-Action Alternative.

Impacts to biological resources would be minor. Ground disturbance associated with facility construction could have some short-term effects on wildlife habitat. There are no federally or state-listed threatened or endangered species known to occur on base property. There are several wetland areas totaling 0.6 acre in the Cantonment Area and 0.2 acre in the Belton Training Complex. Because all of the wetland areas are situated along natural drainages that are not suitable for development, impacts are unlikely.

Reuse of the base property would have few impacts on cultural resources. The Air Force has determined, and the Missouri SHPO has concurred, that there are no archaeological resources on base property. One building has been identified as potentially eligible for the National Register. If the building is determined eligible, the Air Force would consult with the SHPO and the Advisory Council on Historic Preservation to identify appropriate mitigation measures, which could include placing preservation covenants in the conveyance documents or preparation of agreement documents.

NO-ACTION ALTERNATIVE

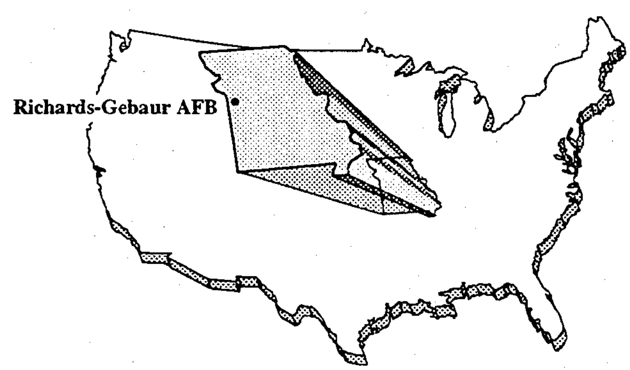
Local Community. The only Air Force activities associated with the No-Action Alternative would be caretaker maintenance of Air Force property by the Air Force Base Conversion Agency Operating Location (OL). Caretaker activities would generate an estimated six direct and five secondary jobs throughout the 20-year analysis period. Projected growth in the region would result in an increase in employment from 482,927 in 1994 to 505,102 in 2014, and population would increase from 705,923 in 1994 to 734,216 in 2014. There would be no land use impacts from the No-Action Alternative, but keeping the base closed would represent a conflict with state and local plans for redevelopment.

Traffic associated with employment and population growth in the region would increase, and the level of service on some regional and local roads would be degraded. Planned roadway improvements would offset impacts to some extent. General aviation operations at Richards-Gebaur Airport would continue, increasing as a result of natural growth over the 20-year analysis period. No impacts to airspace or air transportation are expected. Utility use in the region would also increase as a result of natural growth, but would remain well within the capacity of local utility systems.

Hazardous Materials and Hazardous Waste Management. Small quantities of various types of hazardous materials and pesticides would be used for caretaker activities. All materials and waste would be managed and controlled by the OL in accordance with applicable regulations. IRP activities would continue. Storage tanks would be removed or properly closed according to applicable standards.

Natural Environment. The No-Action Alternative would not cause adverse effects to soils, geological resources, or water resources. Aviation activity at Richards-Gebaur Airport would continue, but air pollutant emissions from aircraft activity would be lower than those projected for the reuse alternatives, and would remain below federal and state standards. Noise levels from airport operations would be similar less than or equal to those projected for the Industrial Alternative. As a result of the increased traffic in the region, the number of people exposed to DNL 65 dB or greater as a result of surface traffic on local roads would increase by 126 from 1994 to 2014.

The No-Action Alternative could have overall beneficial impacts to biological resources as a result of the reduction in human activity, noise, and ground disturbance from preclosure conditions. There would be no impacts to cultural resources because the one potentially eligible historic structure would remain under federal protection, and would be maintained by the OL to prevent deterioration and preserve its structural integrity.



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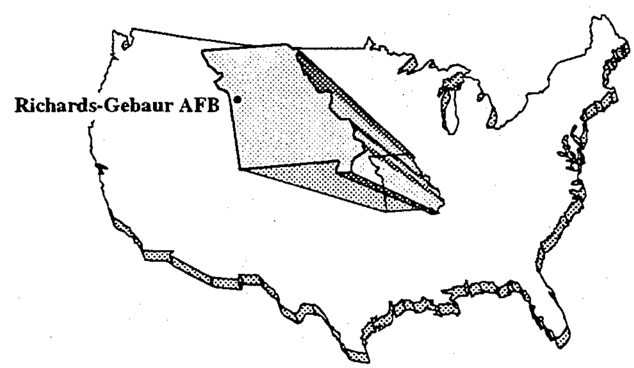


CHAPTER 1
PURPOSE OF AND NEED FOR ACTION

1.0 PURPOSE OF AND NEED FOR ACTION

This environmental impact statement (EIS) examines the potential for impacts to the environment as a result of the disposal and reuse of Richards-Gebaur Air Force Base (AFB), Missouri, as well as from interim activities (e.g., interim outleases) that may be allowed by the Air Force before final disposal of the base. This document has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code [U.S.C.] §§4321 et seq.) and the Council on Environmental Quality (CEQ) regulations implementing NEPA. Appendix A presents a glossary of terms, acronyms, and abbreviations used in this document.

1.1 PURPOSE OF AND NEED FOR

Due to the changing international political scene and the resultant shift toward a reduction in defense spending, the Department of Defense (DOD) must realign and reduce its military forces pursuant to the Defense Base Closure and Realignment Act (DBCRA) of 1990 (Public Law [P.L.] 101-510, Title XXIX). DBCRA established new procedures for closing or realigning military installations in the United States.

DBCRA established an independent Defense Base Closure and Realignment Commission ("Commission") to review the Secretary of Defense's base closure and realignment recommendations. After reviewing these recommendations, the 1991 Commission forwarded its recommended list of base closures and realignments to the President, who accepted the recommendations and submitted them to Congress on July 12, 1991. Since Congress did not disapprove the recommendations within the time period provided under DBCRA, the recommendations have become law.

Because Richards-Gebaur AFB was on the Commission's list, the decision to close the base is final. Richards-Gebaur AFB is scheduled to be closed on September 30, 1994.

To fulfill the requirement of reducing defense expenditures, the Air Force plans to dispose of excess and surplus real property and facilities at Richards-Gebaur AFB. DBCRA requirements relating to disposal of excess and surplus property include:

- Environmental restoration of the property as soon as possible with funds made available for such restoration

- Consideration of the local community's reuse plan prior to Air Force disposal of the property

- Compliance with specific federal property disposal laws and regulations.

The Air Force action, therefore, is to dispose of Richards-Gebaur AFB property and facilities. Usually, this action is taken by the Administrator of General Services. However, DBCRA required the Administrator to delegate to the Secretary of Defense the authorities to utilize excess property, dispose of surplus property, convey airport and airport-related property, and determine the availability of excess or surplus real property for wildlife conservation purposes. The Secretary of Defense has since redelegated these authorities to the respective Service Secretaries.

1.2 DECISIONS TO BE MADE

The purpose of this EIS is to provide information for interrelated decisions concerning the disposition of Richards-Gebaur AFB. The EIS is to provide the decision maker and the public the information required to understand the future potential environmental consequences of disposal as a result of reuse options at Richards-Gebaur AFB.

After completion of this EIS, the Air Force will issue a Record of Decision (ROD) on the disposal of Richards-Gebaur AFB. The ROD will determine the following:

- What property is excess to the needs of DOD and what property is surplus to the needs of the United States of America

- The methods of disposal to be followed by the Air Force

- The terms and conditions of disposal.

The methods of disposal granted by the Federal Property and Administrative Services Act of 1949 and the Surplus Property Act of 1944 and implemented in the Federal Property Management Regulations (FPMR) are:

- Transfer to another federal agency
- Public benefit conveyance to an eligible entity
- Negotiated sale to a public body for a public purpose
- Competitive sale by sealed bid or auction.

The EIS considers environmental impacts of the Air Force's disposal of the installation using all of the above-mentioned procedures and by portraying a variety of potential land uses to cover reasonable future uses of the property and facilities by others. Several alternative scenarios were used to group reasonable land uses and to examine the environmental effects of redevelopment of Richards-Gebaur AFB. This methodology was employed because, although the disposal will have few, if any, direct effects, future

use and control of use by others will create indirect effects. This EIS, therefore, seeks to analyze reasonable redevelopment scenarios to determine the potential indirect environmental effects of Air Force decisions.

1.3 DISPOSAL PROCESS AND REUSE PLANNING

DBCRA requires compliance with NEPA (with some exceptions) in implementation of base closures and realignments. Among the issues that were excluded from NEPA compliance are:

- The selection of installations for closure or realignment
- Analysis of closure impacts.

The Air Force goal is to dispose of Richards-Gebaur AFB property through transfer and/or conveyance to other government agencies or private parties. The reuse plan presented by the Kansas City Aviation Department (KCAD), the designated reuse authority for the base, has been adopted as the Proposed Action in this EIS. The Proposed Action combines expanded airport operations with large areas of industrial and commercial development. The Proposed Action reflects the community's goals of rapid creation of jobs in the near term and creation of a focus of activity to attract additional development to the area over the long term.

The Air Force has also developed three reasonable reuse alternatives in order to provide the decision maker with multiple options regarding ultimate property disposition. The EIS becomes the basis for a broad environmental analysis, thus ensuring that all reasonably foreseeable impacts resulting from potential reuse have been identified and the decision maker has multiple options regarding ultimate property disposition. Subject to the terms of transfer or conveyance, the recipients of the property, planning and zoning agencies, and elected officials will ultimately determine the reuse of the property. The three reuse alternatives involve varying levels of aircraft operations at Richards-Gebaur Airport and mixtures of non-aviation uses on base property. In addition, a No-Action Alternative, which would not involve reuse, is also analyzed.

The Secretary of the Air Force has full discretion in determining how the Air Force will dispose of the property. DBCRA requires the Air Force to comply with federal property disposal laws and the FPMR (41 Code of Federal Regulations [CFR] 101-47). The services were authorized to issue additional regulations, if required, to implement their delegated authorities and the Air Force has issued supplemental regulations at 41 CFR 132. Another provision of the act requires the services to consult with the State Governor and heads of local governments or equivalent political organizations for the purpose of considering any plan for the use of such property by the local community concerned. Accordingly, the Air Force is working with state authorities and the KCAD to meet this requirement.

In some cases, compliance with environmental laws may delay reuse of some parts of the base. Until property can be disposed of by deed, the Air Force may execute interim or long-term leases to allow reuse to begin as quickly as possible. The Air Force would structure the leases to provide the lessees with maximum control over the property, consistent with the terms of the final disposal. Restrictions may be necessary to ensure protection of human health and the environment and to allow implementation of required remedial actions. Environmental analysis in the EIS encompasses those possible interim or long-term leasing decisions.

Certain activities inherent in the development or expansion of an airport constitute federal actions that fall under the statutory and regulatory authority of the Federal Aviation Administration (FAA). The FAA generally reviews these activities through the processing and approval of an Airport Layout Plan (ALP). Goals of the ALP review system are to: (1) determine its effectiveness in achieving safe and efficient utilization of airspace, (2) assess factors affecting the movement of air traffic, and (3) establish conformance with FAA design criteria. The FAA approval action may also include other specific elements such as preparation of the Airport Certification Manual (Part 139); the Airport Security Plan (Part 107); the location, construction, or modification of an air traffic control (ATC) tower, terminal radar approach control (TRACON) facility, other navigational and visual aids, and facilities; and establishment of instrument approach procedures.

In view of its possible direct involvement with the disposal of Richards-Gebaur AFB, the FAA is serving as a cooperating agency in the preparation of the EIS. If surplus property is conveyed to a local agency for airport purposes, the FAA will be the federal agency that would enforce deed covenants requiring the property to be used for airport purposes. Additionally, the FAA may later provide airport improvement program grants to the airport sponsor (local agency taking title). The FAA also has special expertise and the legal responsibility to make recommendations to the Air Force for the disposal of surplus property for airport purposes. The Surplus Property Act of 1944 (50 U.S.C. Appendix 1622[g]) authorizes disposal of surplus real and related personal property for airport purposes and requires the FAA to certify that the property is necessary, suitable, and desirable for an airport.

The potential environmental impacts of airport development must be assessed prior to commitment of federal funding, in accordance with NEPA and FAA Orders 1050.1D, <u>Policies and Procedures for Considering Environmental Impacts</u>, and 5050.4A, <u>Airport Environmental Handbook</u>. Environmental impacts must be assessed prior to authorization of plans of local agencies for the development of the entire area in which the airport is located. Section 4(f) of the Department of Transportation (DOT) Act (recodified at 49 U.S.C., Subtitle I, §303) provides that the Secretary of

Transportation shall not approve any program or project that requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land of an historic site of national, state, or local significance as determined by the officials having jurisdiction thereof unless there is no feasible and prudent alternative to the use of such land and such program or project includes all possible planning to minimize harm resulting from the use.

Compliance with FAA regulations requires the preparation of a proposed ALP. This EIS presents the assessment of potential environmental impacts of available plans. If a reuse proponent has developed only conceptual plans for the airport area, the environmental impacts of that concept plan are analyzed. The FAA may then use this document to complete their NEPA requirements. This EIS also provides environmental analyses to aid FAA decisions on funding requests for airport development projects. The new owners would be required to prepare a final ALP and submit it to the FAA, as appropriate, for approval.

1.4 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

NEPA established a national policy to protect the environment and ensure that federal agencies consider the environmental effects of actions in their decision making. The CEQ is authorized to oversee and recommend national policies to improve the quality of the environment. CEQ has published regulations that described how NEPA should be implemented. The CEQ regulations encourage federal agencies to develop and implement procedures that address the NEPA process in order to avoid or minimize adverse effects on the environment. Air Force Regulation (AFR) 19-2, Environmental Impact Analysis Process (EIAP), addresses implementation of NEPA as part of the Air Force planning and decision-making process.

NEPA, CEQ regulations, FAA Orders 1050.1D and 5050.4A, and AFR 19-2 provide guidance on the types of actions for which an EIS must be prepared. Once it has been determined that an EIS must be prepared, the proponent must publish a Notice of Intent (NOI) to prepare an EIS. This formal announcement signifies the beginning of the scoping period during which the major environmental issues to be addressed in the EIS are identified. A Draft EIS (DEIS) is prepared, which includes the following:

- A statement of the purpose of and need for the action
- A Description of the Proposed Action and alternatives, including the No-Action Alternative
- A description of the environment that would be affected by the Proposed Action and alternatives

- A description of the potential environmental consequences of the Proposed Action and alternatives, and potential mitigation measures.

The DEIS is filed with the U.S. Environmental Protection Agency (EPA), and is circulated to the interested public and government agencies for a period of at least 45 days for review and comment. During this period, a public hearing will be held so that the proponent can summarize the findings of the analysis and receive input from the affected public. At the end of the review period, all substantive comments received must be addressed. A Final EIS (FEIS) is produced that contains responses to comments as well as changes to the document, if necessary.

The FEIS is then filed with U.S. EPA and distributed in the same manner as the DEIS. Once the FEIS has been available for at least 30 days, the Air Force may publish its ROD for the action.

1.4.1 Scoping Process

The Air Force has complied with NEPA requirements for public involvement in the decision process for this EIS through the scoping process. In this process, the significant environmental issues relevant to disposal and reuse are identified and the public is given an opportunity to be involved in the development of the EIS. The NOI (Appendix B) to prepare an EIS for disposal and reuse of Richards-Gebaur AFB was published in the Federal Register on October 9, 1991. Notification of public scoping was also made through local media, as well as through letters to federal, state, and local agencies and officials and interested groups and individuals.

A public meeting was held on November 5, 1991, at the Grandview City Hall to solicit comments and concerns from the general public on the disposal and reuse of Richards-Gebaur AFB. Approximately 20 people attended the meeting. Representatives of the Air Force presented an overview of the meeting's objectives, agenda, and procedures, and described the process and purpose for the development of a disposal and reuse EIS. In addition to verbal comments, written comments were received during the scoping process. These comments, as well as information from the local communities, experience with similar programs, and NEPA requirements, were used to determine the scope and direction of studies/analysis to accomplish this EIS.

1.4.2 Public Comment Process

The DEIS was made available for public review and comment in February 1994. Copies of the DEIS were made available for review in local libraries and provided to those requesting copies. At a public hearing held on March 23 1994, the Air Force presented the findings of the DEIS and invited

public comments. All comments were reviewed and addressed, when applicable, and have been included in their entirety in this document. Responses to comments offering new or changes to data and questions about the presentation of data are also included. Comments simply stating facts or opinions, although appreciated, did not require specific responses. Chapter 9, Public Comments and Responses, more thoroughly describes the comment and response process.

Concurrently with preparation of this EIS, the Air Force is conducting two other studies in support of the disposal and reuse of Richards-Gebaur AFB. The Environmental Baseline Survey (EBS) provides information on the condition of property to be disposed, in compliance with the federal Community Environmental Response Facilitation Act (CERFA) (P.L. 102-42, 42 U.S.C. §9620 [h]). An EBS is required by DOD policy before any property can be sold, leased, transferred, or acquired. The Socioeconomic Impact Analysis Study (U.S. Air Force, 1994) describes the socioeconomic effects of disposal and reuse on local communities. Population and employment projections developed for the socioeconomic study are used in this EIS.

1.5 CHANGES FROM THE DEIS TO THE FEIS

Since the DEIS was published, the KCAD has completed a reuse plan for the base; the Air Force has adopted this plan as the Proposed Action. The major change from the DEIS to the FEIS is the incorporation of this community reuse plan as the Proposed Action.

1.6 ORGANIZATION OF THIS EIS

This EIS is organized into the following chapters and appendices: Chapter 2 provides a description of the Proposed Action and reasonable alternatives that have been identified for reuse of Richards-Gebaur AFB property and provides a comparative summary of the effects of the reuse alternatives on the local community and the natural environment. Chapter 3 presents the affected environment under the baseline conditions of base closure, providing a basis for analyzing the impacts of the reuse alternatives. When needed for analytical comparisons, a preclosure reference is provided for certain resource areas. It describes a point in time at or near the closure announcement, and depicts an active base condition. The results of the environmental analysis are presented in Chapter 4 and form the basis for the summary table at the end of Chapter 2. Chapter 5 lists individuals and organizations consulted during the preparation of the EIS, Chapter 6 provides a list of the document's preparers, Chapter 7 contains references, and Chapter 8 contains an index. Chapter 9 describes the public comment and response process and contains the comments and responses.

In addition to the main text, the following appendices are included in this EIS:

- Appendix A - a glossary of terms, acronyms, and abbreviations
- Appendix B - the NOI to prepare this disposal and reuse EIS
- Appendix C - a list of individuals and organizations who were sent a copy of the FEIS
- Appendix D - an Installation Restoration Program (IRP) bibliography
- Appendix E - a description of the methods used to evaluate the impacts of base reuse on resources of the local community and the environment
- Appendix F - a list of environmental permits held by Richards-Gebaur AFB
- Appendix G - Air Force policy regarding management of asbestos at bases that are closing, and a summary of the results of the basewide asbestos survey
- Appendix H - a listing of plant and animal species occurring on or near the base
- Appendix I - a detailed description of issues and assumptions related to noise effects
- Appendix J - air quality analysis methods
- Appendix K - relevant agency letters and certifications
- Appendix L - influencing factors and environmental impacts by land use category.

1.7 FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

Federal permits, licenses, and entitlements that may be required of recipients of Richards-Gebaur AFB for purposes of redevelopment are presented in Table 1.7-1. State and local regulations may also require additional operating permits.

Table 1.7-1. Federal Permits, Licenses, and Entitlements Potentially Required for Reusers or Developers of Disposed Base Property
Page 1 of 2

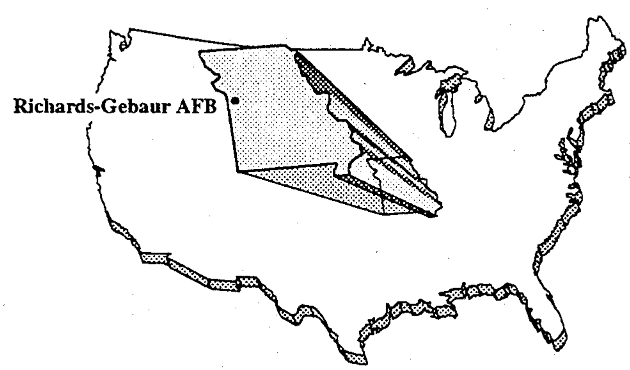
Federal Permit, License, or Entitlement	Typical Activity, Facility, or Category of Persons Required to Obtain the Federal Permit, License, or Entitlement	Authority	Regulatory Agency
Clean Air Act (CAA) Title V permit	Any major source (source that emits more than 100 tons/year of criteria pollutant in a nonattainment area for that pollutant or is otherwise defined in Title I of CAA as a major source); affected sources as defined in Title IV of CAA; sources subject to Section 111 regarding New Source Performance Standards; sources of air toxics regulated under Section 112 of CAA; sources required to have new source or modification permits under Parts C or D of Title I of CAA; and any other source such as Hazardous Waste pollutants designated by U.S. Environmental Protection Agency regulations.	Title V of CAA, as amended by the 1990 CAA Amendments	U.S. Environmental Protection Agency; Missouri Department of Natural Resources
National Pollutant Discharge Elimination System (NPDES) permit	Discharge of pollutant from any point source into waters of the United States.	Section 402 of Clean Water Act, 33 U.S.C. §1342	U.S. Environmental Protection Agency; Missouri Department of Natural Resources
Section 404 (Dredge and Fill) Permit	Any project activities resulting in the discharge of dredged or fill material into bodies of water, including wetlands, within the United States.	Section 404 of Clean Water Act, 33 U.S.C. §1344	U.S. Department of Defense - Army Corps of Engineers, in consultation with U.S. Environmental Protection Agency.

U.S.C. = U.S. Code.

Table 1.7-1. Federal Permits, Licenses, and Entitlements Potentially Required for Reusers or Developers of Disposed Base Property
Page 2 of 2

Federal Permit, License, or Entitlement	Typical Activity, Facility, or Category of Persons Required to Obtain the Federal Permit, License, or Entitlement	Authority	Regulatory Agency
Hazardous waste treatment, storage, or disposal (TSD) facility permit	Owners or operators of a new or existing hazardous waste TSD facility.	Resource Conservation and Recovery Act (RCRA) as amended, 42 U.S.C. §6901; 40 CFR 270	U.S. Environmental Protection Agency; Missouri Department of Natural Resources
U.S. Environmental Protection Agency identification number	Generators or transporters (off-site transport) of hazardous waste.	40 CFR 262.10 (generators); 40 CFR 263, Subpart B (transporters)	U.S. Environmental Protection Agency
Archaeological Resources Protection Act permit	Excavation and/or removal of archaeological resources from public lands or Indian lands and carrying out activities associated with such excavation and/or removal.	Archaeological Resources Protection Act of 1979, 16 U.S.C. §470cc	U.S. Department of the Interior - National Park Service
Endangered Species Act §10 permit	Taking endangered or threatened wildlife species; engaging in certain commercial trade of endangered or threatened plants or removing such plants on property subject to federal jurisdiction.	Section 10 of Endangered Species Act, 16 U.S.C. §1539; 50 CFR 17 Subparts C,D,F, and G.	U.S. Department of the Interior - Fish and Wildlife Service

CFR = Code of Federal Regulations.
U.S.C. = U.S. Code.



CHAPTER 2
ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

This section describes the Proposed Action, reasonable alternatives to the Proposed Action, and the No-Action Alternative. Other future actions in the region that could contribute to cumulative impacts in combination with redevelopment of the base are also briefly described. The potential environmental impacts of the reuse alternatives are summarized in table form.

Generally, the Administrator of the General Services Administration (GSA) has authority to dispose of excess and surplus real property belonging to the federal government. With regard to closure bases, however, the DBCRA requires the GSA Administrator to delegate disposal authority to the Secretary of Defense. The FPMR, which govern property disposal methods associated with base closure, allow the Secretary of Defense to dispose of closure property by transfer to another federal agency, by public benefit conveyance, by negotiated sale to state or local government, and by public sale at auction or sealed bid. These methods, or a combination of them, could be used to dispose of property at Richards-Gebaur AFB.

Provisions of the DBCRA and FPMR require that the Air Force first notify other DOD departments that Richards-Gebaur AFB is scheduled for disposal. Any proposals from these departments for the transfer of Richards-Gebaur AFB are given priority consideration.

Congress enacted the Stewart B. McKinney Act, at 42 U.S.C. §11411, to address the immediate and unprecedented crisis in our country resulting from the lack of shelter for a growing number of individuals and families. Under the McKinney Act, property may be made available either by lease or transfer. Transfers by deed are accomplished as a public health use or public benefit conveyance for public health purposes.

Prior to leasing or deeding the property, the Air Force may consider other federal uses and other important national needs. In deciding the disposition of surplus property, a priority of consideration will be given to uses that assist the homeless. Additionally, there are many factors that will affect the type, location, and amount of McKinney Act housing. First, these factors will be affected by the availability of qualified McKinney Act providers. Next, the ability of the local community, local reuse group, and the individual McKinney Act providers to develop a successful implementation plan that fully incorporates the McKinney Act with respect to the facilities at Richards-Gebaur AFB, will also affect these above noted factors.

Congress has enacted legislation that provides that Indian tribes are to be treated as states or their political subdivision for the disposition of real property affected by a base closure or realignment. This includes: (a) consideration of the tribe's reasonable land reuse plans in the EIS on disposal of the base, and (b) the sale of real and related personal property by negotiated transfer to a public body. Alternatively, Indian tribes may acquire excess real and related personal property via the Indian Self Determination Act at 25 U.S.C. §450. Under this statute, Indian tribes may obtain excess real and related personal property for certain beneficial uses (e.g., hospitals, schools). To obtain property under this law, the tribe must apply for a grant from the Secretary of the Interior. If the grant is approved, the Secretary of the Interior then advises the land-holding agency (in this case the Air Force) to transfer the property to the Department of the Interior to be held in trust for the purposes of the Self Determination Act grant. This type of transfer is analogous to a no-cost public benefit conveyance.

An Air Force Base Conversion Agency (AFBCA) Operating Location (OL) has been established at Richards-Gebaur AFB. The responsibilities of the OL include coordinating post-closure activities with the active force closure activities, establishing a caretaker force to maintain Air Force-controlled properties after closure, and serving as the Air Force local liaison to community reuse groups until lease termination, title surrender, or disposal (as appropriate) of the Air Force-controlled property has been completed. For the purposes of environmental analysis, it was assumed that this team would consist of six direct employees at the time of closure, including both Air Force employees and nonfederal supporting personnel. The OL, as used in this document, may refer to either the AFBCA or nonfederal personnel.

In some cases, each group may have distinct responsibilities. For example, under the No-Action Alternative, the nonfederal personnel would be responsible for the management and disposition of their own hazardous materials and waste. The Air Force OL would be responsible for inspection and oversight to ensure that hazardous substance practices on Air Force-controlled property are in compliance with pertinent regulations.

In order to address the range of potential environmental impacts of disposal and reuse, four conceptual reuse alternatives have been developed in addition to the No-Action Alternative:

- The **Proposed Action** combines continued support of airport operations with large areas set aside for office and industrial development. Aircraft operations would include general aviation, maintenance, commuter, cargo, and pilot training, as well as continuing military transients; total operations would reach 114,000 by 2014. The main runway would be used, and the crosswind runway would be activated if justified by demand. In addition to aviation support activities, the plan incorporates industrial, office/industrial park, and commercial land uses.

Portions of the base would also be used by the U.S. Marine Corps and the U.S. Army.

- The **Aviation Alternative** centers around support for a mixed use airport with civilian aviation activities including general aviation, maintenance, commuter, pilot training, and air cargo components, in addition to continuing transient military operations. Total flight operations would exceed 96,000 by 2014, using the main runway and reactivated crosswind runway. The plan incorporates aviation support, industrial, residential, and public facilities/recreation land uses.

- The **Aviation with Mixed Use Alternative** focuses on supporting a general aviation airport with more than 105,000 operations by 2014. Operations would include general aviation and pilot training, as well as continuing military transient operations, using a shortened main runway and reactivated, shortened crosswind runway. The major land uses would be aviation support, industrial, and public facilities/recreation. Smaller areas are proposed to support institutional (educational) and commercial uses.

- The **Industrial Alternative** features extensive industrial development in addition to support for a small general aviation airport with approximately 76,000 operations, including military transients, by 2014. Only the main runway would be active. The remaining portions of the base would be redeveloped for institutional (medical and educational), commercial, residential, public facilities/recreation, and agricultural uses.

- The **No-Action Alternative** would result in the base being placed in caretaker status. Maintenance activities would take place on base and civilian aviation operations would continue at the airport.

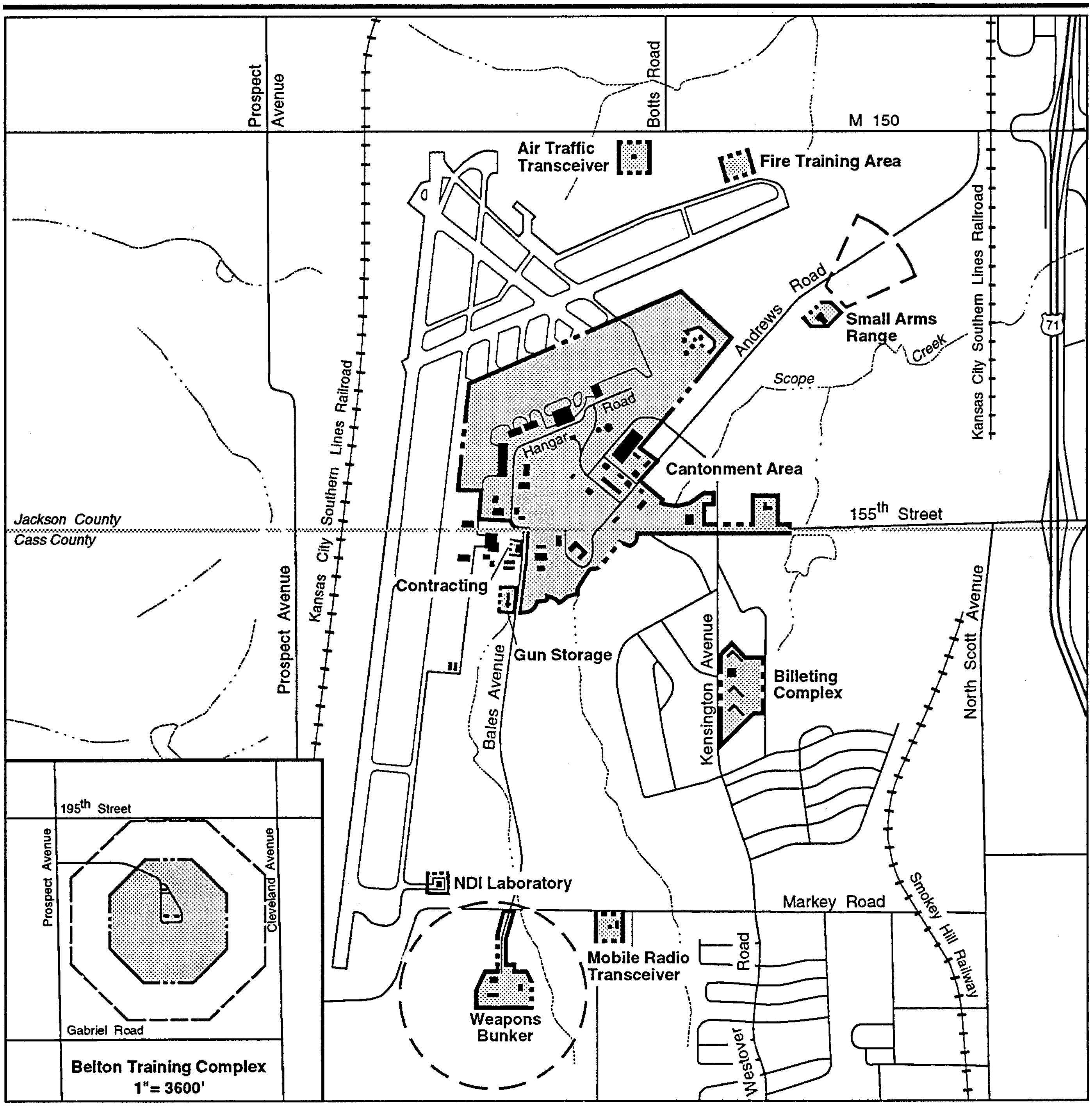
In order to accomplish impact analysis, a set of general assumptions was made. These assumptions include employment and population changes arising from implementation of each reuse plan, consistent land use designations for similar reuse options, proportion of ground disturbance anticipated for each land use type, transportation and utility effects of each proposal as a function of proposed land use and employment due to redevelopment, and anticipated phasing of the various elements of each reuse plan (as measured at the closure baseline and at the baseline plus 5, 10, and 20 years). Details regarding the generation of these assumptions are found in Appendix E, Methods of Analysis. Specific assumptions developed for individual reuse plans are identified in the discussion of each alternative, within Section 2.2.

During the development of alternatives addressed in the EIS, the Air Force considered the compatibility of future land uses with current site conditions that may restrict reuse activities to protect human health and the environment. These conditions include potential contamination from past releases of hazardous substances and Air Force efforts to remediate the contamination under the IRP. IRP remediation at Richards-Gebaur AFB and other environmental studies may result in lease/deed restrictions that limit reuse options at certain locations within the base. Additionally, the Air Force may retain access rights to these sites to implement IRP remediation (e.g., temporary easement for soil sampling).

In 1985, approximately 1,360 acres of Richards-Gebaur AFB property were conveyed to Kansas City. Richards-Gebaur AFB now consists of approximately 426 acres in 11 parcels (Figure 2.1-1). The Cantonment Area is the largest parcel and contains the main aviation support, operations, and administration areas. Nine smaller parcels surrounding the Cantonment Area consist of various isolated facilities retained by the Air Force. The Weapons Bunker is surrounded by a 106-acre safety easement and there is a 20-acre safety easement adjacent to the Small Arms Range. The Belton Training Complex, about 4 miles south of the Cantonment Area in an unincorporated portion of Cass County, is surrounded by a 287-acre easement within which development is limited. The Belton Training Complex is largely undeveloped, and has been permitted to the U.S. Army Reserve since 1988 for training maneuvers. The acreages of these parcels are listed below.

Parcel	Acreage
Cantonment Area	208
Contracting	1
Gun Storage	1
Air Traffic Transceiver	3
Fire Training Area	2
Small Arms Range	2
Billeting Complex	13
Nondestructive Inspection (NDI) Laboratory	1
Mobile Radio Transceiver	3
Weapons Bunker	8
Belton Training Complex	184

Within this EIS, all 11 parcels of Air Force-owned property are discussed as on-base property. All other public and private property in the region is referred to as off-base property. The alternatives developed for the environmental analysis include reuse of all 11 parcels of on-base property. All acreages used in this document are approximate.



EXPLANATION

Base Boundary

Easement

Base Property

0 500 1000 2000 Feet

Richards-Gebaur AFB Property

Figure 2.1-1

2.2 DESCRIPTION OF THE PROPOSED ACTION

Section 2905(b)(2)(E) of DBCRA requires the Air Force, as part of the disposal process, to consult with the applicable state governor and heads of local governments, or equivalent political organizations, for the purposes of considering any plan for the use of such property by the concerned local community. Air Force policy is to encourage timely community reuse planning by offering to use the community's plan for reuse or development of land and facilities as the Proposed Action in the EIS. The plan presented by the KCAD has been adopted as the Proposed Action for environmental analysis.

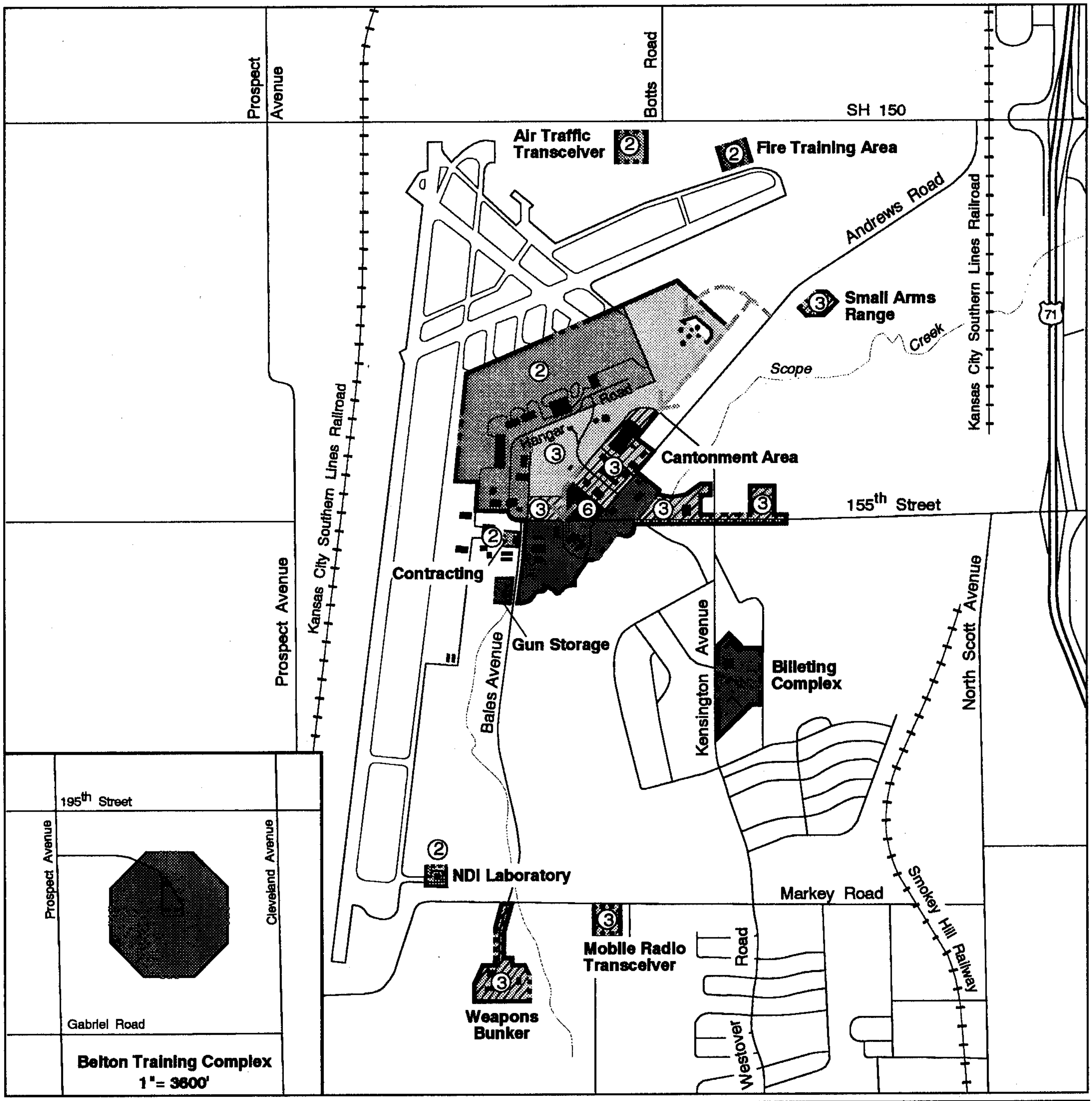
The airfield (runways, taxiways, and associated support facilities) at Richards-Gebaur Airport is owned by the KCAD and is not part of the property being disposed by the Air Force. However, because airfield operations are part of the community reuse plan and are essential to the aviation support activities proposed for Richards-Gebaur AFB, assumed airfield operations are discussed for each alternative. Baseline general aviation operations that would occur under the No-Action Alternative as a result of growth in the region are included within the projections for the reuse alternatives (refer to Section 2.3.4). The impacts of reuse aircraft operations are thus presented and analyzed herein as total (cumulative) impacts of reuse opportunities plus baseline growth.

The KCAD has prepared a community reuse plan for the property to be disposed by the Air Force. This community plan is presented here as the Proposed Action for purposes of analysis. This plan outlines the conceptual land uses and addresses reuse goals and objectives. The Proposed Action is a comprehensive reuse plan that focuses on a mixed use airport with civilian aviation and non-aviation activities, and a military non-aviation component.

The land uses presented in the Proposed Action (Figure 2.2-1) provide a framework for development, and are expected to be a portion of a larger development area that would include most of the original base property. The aviation-related areas would encompass 88 acres or 21 percent of the base property. The non-aviation areas would comprise the remaining 338 acres of the base, with military uses occupying 231 acres. The acreage associated with each land use category is provided in Table 2.2-1.

The following types of data were provided in the community reuse plan:

- Amount of land use acreage
- Amount of development (i.e., demolition, new construction)
- Project-related employment and population projections
- Projected fleet mix and flight operations
- Types of airfield improvements



EXPLANATION

- ① Airfield *
- ② Aviation Support
- ③ Industrial
- ③ Office/Industrial Park (OIP)
- ④ Institutional (Medical) *
- ⑤ Institutional (Educational) *
- ⑥ Commercial
- ⑦ Residential *
- ⑧ Public Facilities/ Recreation *
- ⑨ Agriculture *
- Military
- Base Boundary
- Proposed Access

0 500 1000 2000 Feet

*Standard land use designation not applicable to this figure.

Proposed Action

Figure 2.2-1

Table 2.2-1. Land Use Acreage - Proposed Action

Land Use	Acreage
Aviation Support	88
Industrial	57
Office/Industrial Park	45
Commercial	5
Military	231
Total	426

- Utility demands
- Transportation improvements and access.

Where data representing specific reuse activities were not available, the Air Force made assumptions to support analysis as follows:

- Acreages of each land use disturbed by construction and demolition activities
- Traffic generation
- Phasing plans for reuse.

The amount of potential development through 2014, including demolition, retention, and new construction for each land use under the Proposed Action is provided in Table 2.2-2. It should be noted, however, that existing (retained) facilities may not be fully utilized during this 20-year period.

Table 2.2-2. Facility Development - Proposed Action

Land Use	Existing Facility Demolition	Existing Facility Retention	New Facility Construction
	(thousands of square feet of floor space)		
Aviation Support	5	283	66
Industrial	3	0	770
Office/Industrial Park	26	167	244
Commercial	0	0	152
Military	6	183	8
Total	40	633	1,240

The acreages within each land use assumed to be disturbed by construction of facilities, infrastructure improvements, or other operational activities under the Proposed Action are provided in Table 2.2-3 for three phases of

Table 2.2-3. Acres Disturbed - Proposed Action

Land Use	Acres 1994-1999	Disturbed 1999-2004	By Phase 2004-2014	Total
Aviation Support	1	1	2	4
Industrial	13	13	26	52
Office/Industrial Park	5	5	11	21
Commercial	1	1	2	4
Military	2	0	0	2
Total	22	20	41	83

development: 1994-1999, 1999-2004, and 2004-2014. The sections below describe activity associated with each land use category.

2.2.1 Airfield

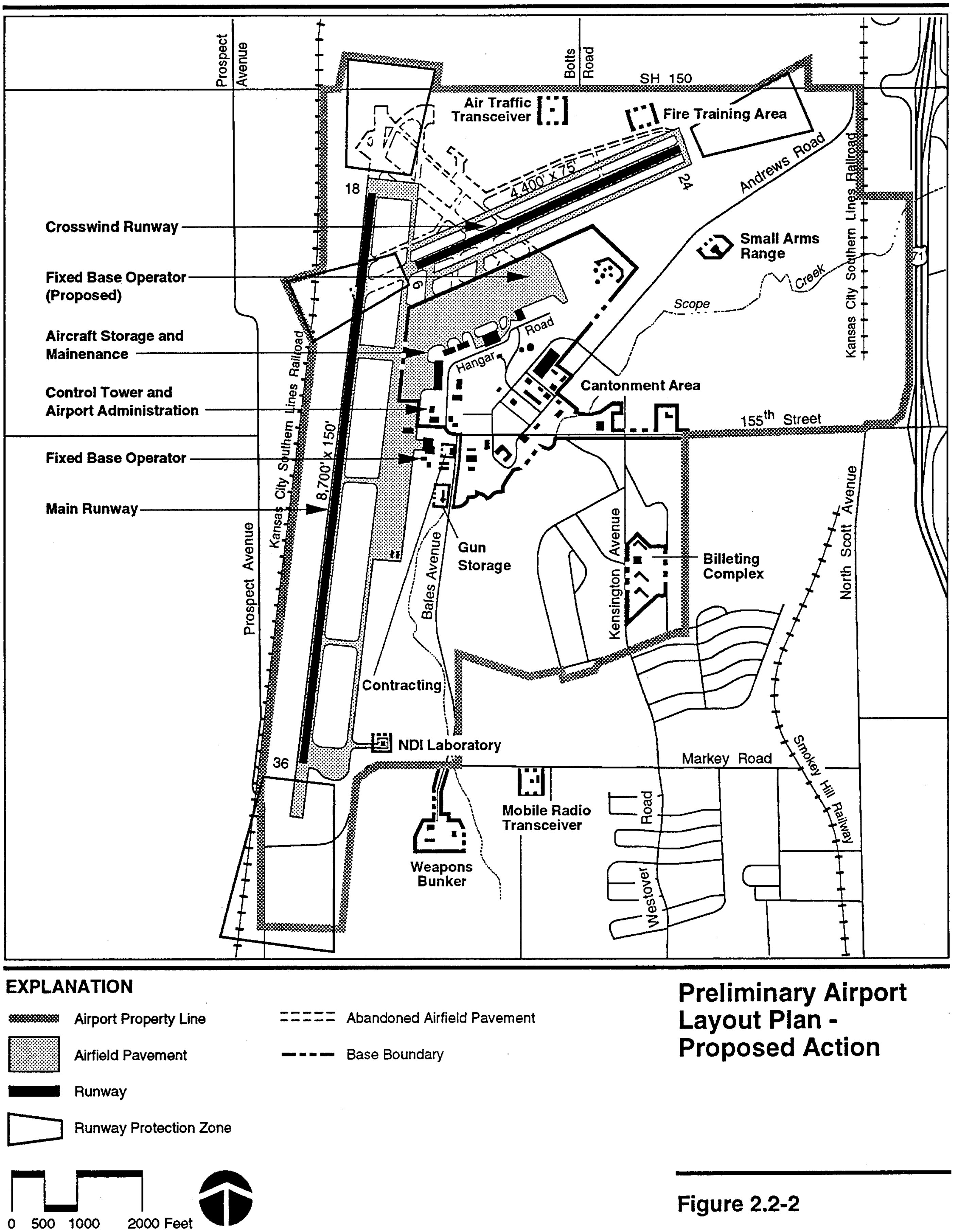
Projected aviation operations are provided in Table 2.2-4 for 1999, 2004, and 2014. An operation is defined as one landing or takeoff. Beyond closure, projected annual operations were developed within six overall activity categories: transient military (Air Force, Army, and Navy), general aviation, commuter, air cargo, aircraft maintenance, and flight training. For analysis purposes, 50 percent of cargo operations and 98 percent of general aviation operations are expected to occur during daytime hours (7:00 a.m. to 10:00 p.m.) during each of the analysis periods. All other aircraft operations (military, aircraft maintenance, commuter, and flight training) would occur only during daytime hours. Most of the operations would use the main runway; the crosswind runway would be opened when demand increased sufficiently to require it. It is assumed that 60 percent of operations on the main runway would depart to the south and 40 percent would depart to the north. On the crosswind runway, it is assumed that 60 percent of operations would depart to the southwest and 40 percent would depart to the northeast. All turbojet-powered aircraft are assumed to be in compliance with the FAA's Stage 3 Noise Standards.

The community plan includes a Preliminary Airport Layout Plan for the Proposed Action (Figure 2.2-2). The airfield includes Runway 18/36 (8,700 feet long and 150 feet wide), Runway 06/24 (4,400 feet long and 75 feet wide), taxiways, and runway protection zones (RPZs). The RPZs are based on the size and type of aircraft, approach, and instrumentation available on that runway approach. An existing civilian Fixed Base Operator (FBO) would remain under reuse. For analysis purposes, it is assumed that an additional FBO would use a portion of the operational apron adjacent to the south side of the crosswind runway. The control tower is owned by the Air Force and operated by contractors; under reuse, it is assumed that

Table 2.2-4. Projected Flight Operations - Proposed Action

Year	Activity	Function	FAA Stage	%	Aircraft Operations[a] Fleet Mix	Day	Night	Total
1999	Military	Transient	NA	40	A-10	400	0	400
			NA	10	C-130/141	100	0	100
			NA	10	T-34/37/38/43/44	100	0	100
			NA	30	Miscellaneous[b]	300	0	300
			NA	10	Helicopter	100	0	100
	General Aviation	Private Aircraft	NA	65.5	Single-Engine Piston	19,404	396	19,800
			NA	18.5	Multi-Engine Piston	5,488	112	5,600
			NA	8	Turboprop	2,450	50	2,500
			3	6	Turbojet	1,764	36	1,800
			NA	2	Helicopter	490	10	500
	Commuter	Passenger Service	3	100	Dash-7 Turboprop	1,500	0	1,500
	Air Cargo	Cargo	2	100	DC-9 Jet	200	200	400
	Aircraft Maintenance	Checkout	3	100	B-727-200 Retrofit	200	0	200
	Flight Training	Private Aircraft	NA	85	Single-Engine Piston	21,000	0	21,000
			NA	15	Multi-Engine Piston	3,700	0	3,700
	Total					57,166	834	58,000
2004	Military	Transient	NA	40	A-10	400	0	400
			NA	10	C-130/141	100	0	100
			NA	10	T-34/37/38/43/44	100	0	100
			NA	30	Miscellaneous[b]	300	0	300
			NA	10	Helicopter	100	0	100
	General Aviation	Private Aircraft	NA	63	Single-Engine Piston	25,480	520	26,000
			NA	16.5	Multi-Engine Piston	6,664	136	6,800
			NA	11	Turboprop	4,508	92	4,600
			3	7.5	Turbojet	3,038	62	3,100
			NA	2	Helicopter	980	20	1,000
	Commuter	Passenger Service	3	100	Dash-7 Turboprop	2,500	0	2,500
	Air Cargo	Cargo	3[c]	100	DC-9 Jet	450	450	900
	Aircraft Maintenance	Checkout	3	40	L-1011 Jet	200	0	200
			3	60	B-727-200 Retrofit	300	0	300
	Flight Training	Private Aircraft	NA	84	Single-Engine Piston	26,500	0	26,500
			NA	16	Multi-Engine Piston	5,100	0	5,100
	Total					76,670	1,330	78,000
2014	Military	Transient	NA	40	A-10	400	0	400
			NA	10	C-130/141	100	0	100
			NA	10	T-34/37/38/43/44	100	0	100
			NA	30	Miscellaneous[b]	300	0	300
			NA	10	Helicopter	100	0	100
	General Aviation	Private Aircraft	NA	55	Single-Engine Piston	34,202	698	34,900
			NA	23	Multi-Engine Piston	14,112	288	14,400
			NA	13	Turboprop	8,036	164	8,200
			3	7	Turbojet	4,606	94	4,700
			NA	2	Helicopter	1,470	30	1,500
	Commuter	Passenger Service	3	100	Dash-7 Turboprop	4,000	0	4,000
	Air Cargo	Cargo	3[c]	100	DC-9 Jet	800	800	1,600
	Aircraft Maintenance	Checkout	3	50	L-1011 Jet	500	0	500
			3	50	B-727-200 Retrofit	500	0	500
	Flight Training	Private Aircraft	NA	85	Single-Engine Piston	36,300	0	36,300
			NA	15	Multi-Engine Piston	6,400	0	6,400
	Total					110,694	3,306	114,000

Notes: (a) An aircraft operation is one takeoff or one landing.
(b) Includes small numbers of operations by A-3, A-4, A-6, A-7, C-5, C-7, C-9, C-12, C-21, F-4, F-5, F-14, F-15, F-16, F-18, KC-10, KC-135, and P-3 aircraft.
(c) Assumes the DC-9 will be retrofitted to meet FAA Stage 3 noise standard requirements.
FAA = Federal Aviation Administration.
NA = not applicable.



Preliminary Airport Layout Plan - Proposed Action

Figure 2.2-2

operation would be the responsibility of the KCAD. Air cargo, maintenance, and military transient operations would use Runway 18/36. The existing apron is adequate for use by the projected aircraft.

The plan includes the following improvements to the airfield portion of the airport:

- Upgrade Runway 18/36 and related taxiways to a pavement strength of 180,000 pounds dual wheel loading
- Reduce Runway 18/36 length to 8,700 feet by moving the threshold of Runway 18 southward by 500 feet
- Construct a holding apron north of Runway 18
- Restore Runway 6/24 to a length of 4,400 feet long by 75 feet wide, with a pavement strength of 30,000 pounds single wheel loading
- Relocate instrument landing system (ILS) glide slope to the west side of Runway 18/36
- Relocate and reconfigure taxiway A4 to a right angle
- Establish global positioning system (GPS) non-precision approaches for Runways 18 and 6/24
- Add visual glide slope indicators and airfield lighting for Runway 6/24
- Construct full-length parallel taxiways for both sides of Runway 6/24.

2.2.2 Aviation Support

The aviation support area encompasses 88 acres, or 21 percent of the base, and includes the Air Traffic Transceiver, Contracting, Fire Training Area, and the NDI Laboratory parcels and portions of the Cantonment Area. The aviation support land use includes areas for the second FBO, aircraft storage and maintenance, general aviation, commuter service, flight training, and air cargo activities.

The aviation support areas in the Cantonment Area include the fire station, base operations, fuel storage, and hangars. One building in the Contracting parcel would be demolished; approximately 66,000 square feet of new general aviation hangar space would be constructed on the north side of the operational apron. Aviation support facilities would be completely utilized by 2014.

2.2.3 Industrial

The industrial area covers 57 acres, or 13 percent of the base, and includes mostly undeveloped or vacant portions of the Cantonment Area. The industrial land uses focus on manufacturing, warehousing, and distribution activities. The existing railroad spur would be repaired and extended to the industrial area. One small building would be demolished and 770,000 square feet of new facilities would be developed, all of which would be utilized within the 20-year analysis period.

2.2.4 Office/Industrial Park

The office/industrial park area covers 45 acres, or 11 percent of the base acreage, and is located within the central and eastern portion of the Cantonment Area and the Small Arms Range, Weapons Bunker, and Mobile Radio Transceiver parcels. Office/industrial park land uses would include the reuse of the flight simulator, maintenance shops, and engineering administration facility. Construction of 244,000 square feet of office/ industrial space on approximately 22 acres would be complete by the end of the 20-year analysis period. Existing facilities would also be 100 percent utilized.

2.2.5 Commercial

The commercial area includes 5 acres, or 1 percent of the base property. This area is in the southern portion of the Cantonment Area, on the north side of 155th Street. There are currently no existing facilities within this area. New development of 152,000 square feet of retail space would be completed by the end of the 20-year analysis period.

2.2.6 Military

The military land use areas include 231 acres, or 54 percent of the base property. The military land use areas include portions of the Cantonment Area, and the Gun Storage, Billeting Complex, and Belton Training Complex parcels. Three units from the U.S. Marine Corps would relocate to the facilities on base property for reserve training, medical, recruiting, and administrative activities. The U.S. Marine Corps would take over operations of the dining hall and associated swimming pool and tennis courts. One of the dormitories in the Billeting Complex would be used for permanent housing for bachelor enlisted personnel; the other two would be used for transient lodging. In addition, the U.S. Army Reserve would continue to utilize the Belton Training Complex for training maneuvers, similar to preclosure conditions. Uses within the military areas would be similar to existing uses for those parcels. There would be minimal demolition. The relocation of the Base Exchange and Commissary to the proposed military land use area would entail approximately 8,000 square feet of new

construction. Reuse activities within the military land use areas would be complete within the first 5 years after base closure.

2.2.7 Employment and Population

By 2014, the Proposed Action would generate site-related employment of 1,400 direct jobs (Table 2.2-5), not including construction jobs. A total of 56 military personnel would reside in the residential facilities at the Billeting Complex.

Table 2.2-5. Site-Related Employment and Population - Proposed Action

	Closure	1999	2004	2014
Direct Employment	6	500	800	1,400
On-Base Population	0	56	56	56

2.2.8 Transportation

Under the Proposed Action, use of existing access roads to base property would continue. Three new roads would be added to facilitate access to and from the property. Access to the northeast side of the Cantonment Area would be provided from Andrews Road (see Figure 2.2-1). Access parallel to Andrews Road would then be provided from Kensington Avenue to this new access road. A third access road would extend Kensington Avenue south to 155th Street. All streets within the airport boundary would be widened to 36 feet. Based on land use and employment projections, this alternative would generate an average of 5,300 vehicle trips daily by 2014.

2.2.9 Utilities

By 2014, the projected activities associated with the Proposed Action would generate the following total utility usage:

- Water - 339,000 gallons per day (GPD)
- Wastewater - 309,000 GPD
- Solid Waste - 6.4 tons per day
- Electricity - 74 megawatt-hours per day (MWH/day)
- Natural Gas - 1 million cubic feet per day (MMCF/day).

2.3 DESCRIPTION OF ALTERNATIVES

2.3.1 Aviation Alternative

The land uses presented in the Aviation Alternative (Figure 2.3-1) provide a framework for development of a comprehensive reuse plan based on a multi-purpose airport, similar to that of the Proposed Action. The airfield would be used primarily by general aviation aircraft. Additional activities requiring airfield support would include the maintenance of all types of aircraft, passenger commuter services, jet pilot flight training, and the transport of air cargo. Non-aviation uses would consist of industrial, residential, and public facilities/recreation. The acreage associated with each land use category is provided in Table 2.3-1.

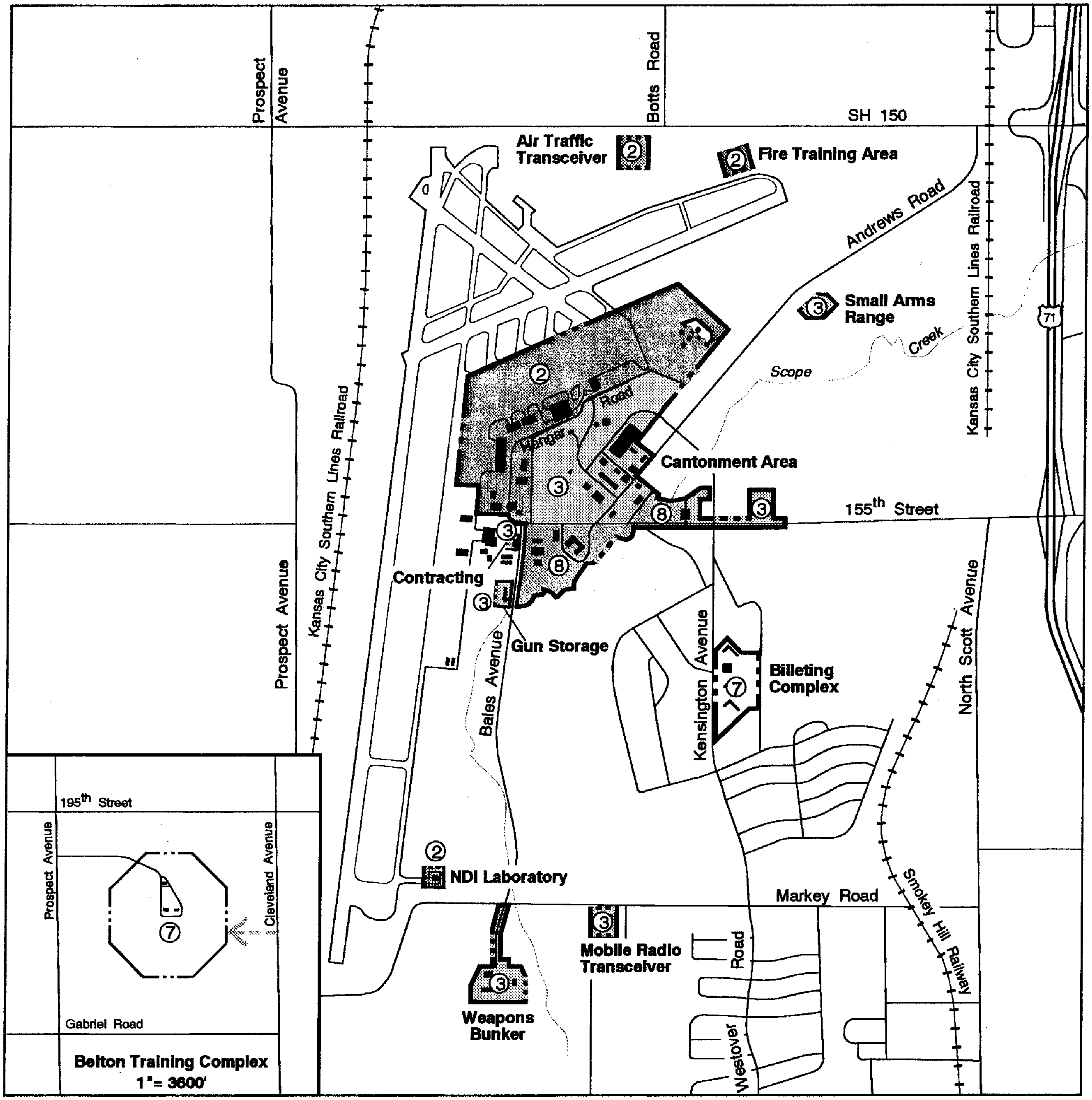
Table 2.3-1. Land Use Acreage - Aviation Alternative

Land Use	Acreage
Aviation Support	115
Industrial	84
Residential	197
Public Facilities/Recreation	30
Total	426

The following assumptions were developed in support of the analysis for the Aviation Alternative:

- Projected fleet mix and flight operations
- Airport boundary
- Land uses and amount of land use acreage
- Amount of development (i.e., demolition, new construction)
- Acreages of each land use disturbed by construction and demolition activities
- Project-related employment and population projections
- Traffic generation and required access points
- Projected utility use.

The amount of potential development through 2014, including demolition, retention, and new construction for each land use under the Aviation Alternative is provided in Table 2.3-2. It should be noted, however, that



EXPLANATION

① Airfield *	⑤ Institutional (Educational)*	⑨ Agriculture *
② Aviation Support	⑥ Commercial*	Base Boundary
③ Industrial	⑦ Residential	Proposed Access
④ Institutional (Medical) *	⑧ Public Facilities/ Recreation	

0 500 1000 2000 Feet

* Standard land use designation not applicable to this figure.

Aviation Alternative

Figure 2.3-1

Table 2.3-2. Facility Development - Aviation Alternative

Land Use	Existing Facility Demolition	Existing Facility Retention	New Facility Construction
	(thousands of square feet of floor space)		
Aviation Support	0	283	57
Industrial	51	177	240
Residential	3	89	153
Public Facilities/Recreation	2	68	0
Total	56	617	450

existing (retained) facilities may not be fully utilized during this 20-year period.

The acreages within each land use assumed to be disturbed by construction of facilities, infrastructure improvements, or other operational activities under the Aviation Alternative are provided in Table 2.3-3 for three phases of development: 1994-1999, 1999-2004, and 2004-2014. The sections below describe activities associated with each land use category.

Table 2.3-3. Acres Disturbed - Aviation Alternative

	Acres Disturbed (by phase)			
Land Use	1994-1999	1999-2004	2004-2014	Total
Aviation Support	7	2	9	18
Industrial	10	12	1	23
Residential	19	18	0	37
Public Facilities/Recreation	2	0	0	2
Total	38	32	10	80

2.3.1.1 Airfield. Projected aviation operations are provided in Table 2.3-4 for 1999, 2004, and 2014. Beyond closure, projected annual operations were developed within six overall activity categories: transient military (Air Force, Army, and Navy), general aviation, commuter, air cargo, aircraft maintenance, and jet pilot flight training. For analysis purposes, 98 percent of general aviation operations and 50 percent of the air cargo operations are expected to occur during daytime hours (7:00 a.m. to 10:00 p.m.) during each of the years depicted. Aircraft in each of the other activity categories are projected to operate only during daytime hours. It is assumed that 60 percent of operations on the main runway would depart to the south and 40 percent would depart to the north. On the crosswind runway, it is assumed that 60 percent of operations would depart to the southwest and

Table 2.3-4. Projected Flight Operations - Aviation Alternative

Year	Activity	Function	FAA Stage	%	Aircraft Operations[a] Fleet Mix	Day	Night	Total
1999	Military	Transient	NA	25	A-10	250	0	250
			NA	14	C-130/141	141	0	141
			NA	31	T-34/37/38/43/44	312	0	312
			NA	23	Miscellaneous[b]	232	0	232
			NA	7	Helicopter	66	0	66
	General Aviation	Private Aircraft	NA	81	Single-Engine Piston	40,484	826	41,310
			NA	6	Multi-Engine Piston	2,999	61	3,060
			NA	7.5	Turboprop	3,749	77	3,826
			3	4	Turbojet	1,999	41	2,040
			NA	1.5	Helicopter	750	15	765
	Commuter	Passenger Service	3	100	Dash-7 Turboprop	520	0	520
	Air Cargo	Cargo	2	100	DC-9 Jet	260	260	520
	Aircraft Maintenance	Checkout	3	10	L-1011 Jet	50	0	50
			3	30	MD-80 Jet	150	0	150
			3	60	B-727-200 Retrofit	300	0	300
	Flight Training	Pilot Training	3	100	MD-80 Jet	500	0	500
	Total					52,762	1,280	54,042
2004	Military	Transient	NA	25	A-10	250	0	250
			NA	14	C-130/141	141	0	141
			NA	31	T-34/37/38/43/44	312	0	312
			NA	23	Miscellaneous[b]	232	0	232
			NA	7	Helicopter	66	0	66
	General Aviation	Private Aircraft	NA	79	Single-Engine Piston	50,323	1,027	51,350
			NA	6	Multi-Engine Piston	3,822	78	3,900
			NA	8	Turboprop	4,937	101	5,038
			3	5	Turbojet	3,344	68	3,412
			NA	2	Helicopter	1,274	26	1,300
	Commuter	Passenger Service	3	100	Dash-7 Turboprop	1,040	0	1,040
	Air Cargo	Cargo	3[c]	100	DC-9 Jet	520	520	1,040
	Aircraft Maintenance	Checkout	3	10	L-1011 Jet	100	0	100
			3	30	MD-80 Jet	300	0	300
			3	60	B-727-200 Retrofit	600	0	600
	Flight Training	Pilot Training	3	100	MD-80 Jet	1,000	0	1,000
	Total					68,261	1,820	70,081
2014	Military	Transient	NA	25	A-10	250	0	250
			NA	14	C-130/141	141	0	141
			NA	31	T-34/37/38/43/44	312	0	312
			NA	23	Miscellaneous[b]	232	0	232
			NA	7	Helicopter	66	0	66
	General Aviation	Private Aircraft	NA	75	Single-Engine Piston	65,415	1,335	66,750
			NA	6	Multi-Engine Piston	5,233	107	5,340
			NA	8	Turboprop	7,196	147	7,343
			3	8	Turbojet	6,760	138	6,898
			NA	3	Helicopter	2,617	53	2,670
	Commuter	Passenger Service	3	100	Dash-7 Turboprop	1,560	0	1,560
	Air Cargo	Cargo	3[c]	100	DC-9 Jet	780	780	1,560
	Aircraft Maintenance	Checkout	3	10	L-1011 Jet	150	0	150
			3	30	MD-80 Jet	450	0	450
			3	60	B-727-200 Retrofit	900	0	900
	Flight Training	Pilot Training	3	100	MD-80 Jet	1,500	0	1,500
	Total					93,562	2,560	96,122

Notes: (a) An aircraft operation is one takeoff or one landing.
(b) Includes small numbers of operations by A-3, A-4, A-6, A-7, C-5, C-7, C-9, C-12, C-21, F-4, F-5, F-14, F-15, F-16, F-18, F-27, KC-10, KC-135, and P-3 aircraft.
(c) Assumes the DC-9 will be retrofitted to meet FAA Stage 3 noise standard requirements.
FAA = Federal Aviation Administration.
NA = not applicable.

40 percent would depart to the northeast. All turbojet-powered aircraft are assumed to be in compliance with the FAA's Stage 3 Noise Standards.

Approximately 80 percent of single-engine aircraft operations would use the crosswind runway. Crosswind conditions are less than 13 miles per hour, the acceptable planning standard for this mix of aircraft, approximately 80 percent of the time. Separation of smaller aircraft from larger aircraft is preferable, if possible, especially for visual flight rules (VFR) training operations. All multi-engine and the remainder of the single-engine operations would use the main runway.

The Aeronautical Facilities Study (Coffman Associates, Inc., 1987) prepared for the civilian use of the aviation facilities adjacent to Richards-Gebaur AFB used the FAA Advisory Circular 150/5300-12 in developing the airfield layout (e.g., dimensions, separations, and clearances) to allow operation of all commercial aircraft. That study and FAA Advisory Circular 150/5300-13, which includes revised design criteria, were used in developing the Preliminary Airport Layout Plan for the Aviation Alternative (Figure 2.3-2). The airfield includes Runway 18/36 (9,200 feet long and 150 feet wide), Runway 06/24, taxiways, and RPZs. The civilian FBO would remain under reuse. The control tower and fire station are currently owned by the Air Force and operated by contractors; under reuse, it is assumed that operation of these facilities would be the responsibility of the KCAD. Air cargo, maintenance, and jet pilot training operations would use Runway 18/36, which is capable of supporting large jet aircraft. The existing apron is adequate for use by the projected aircraft.

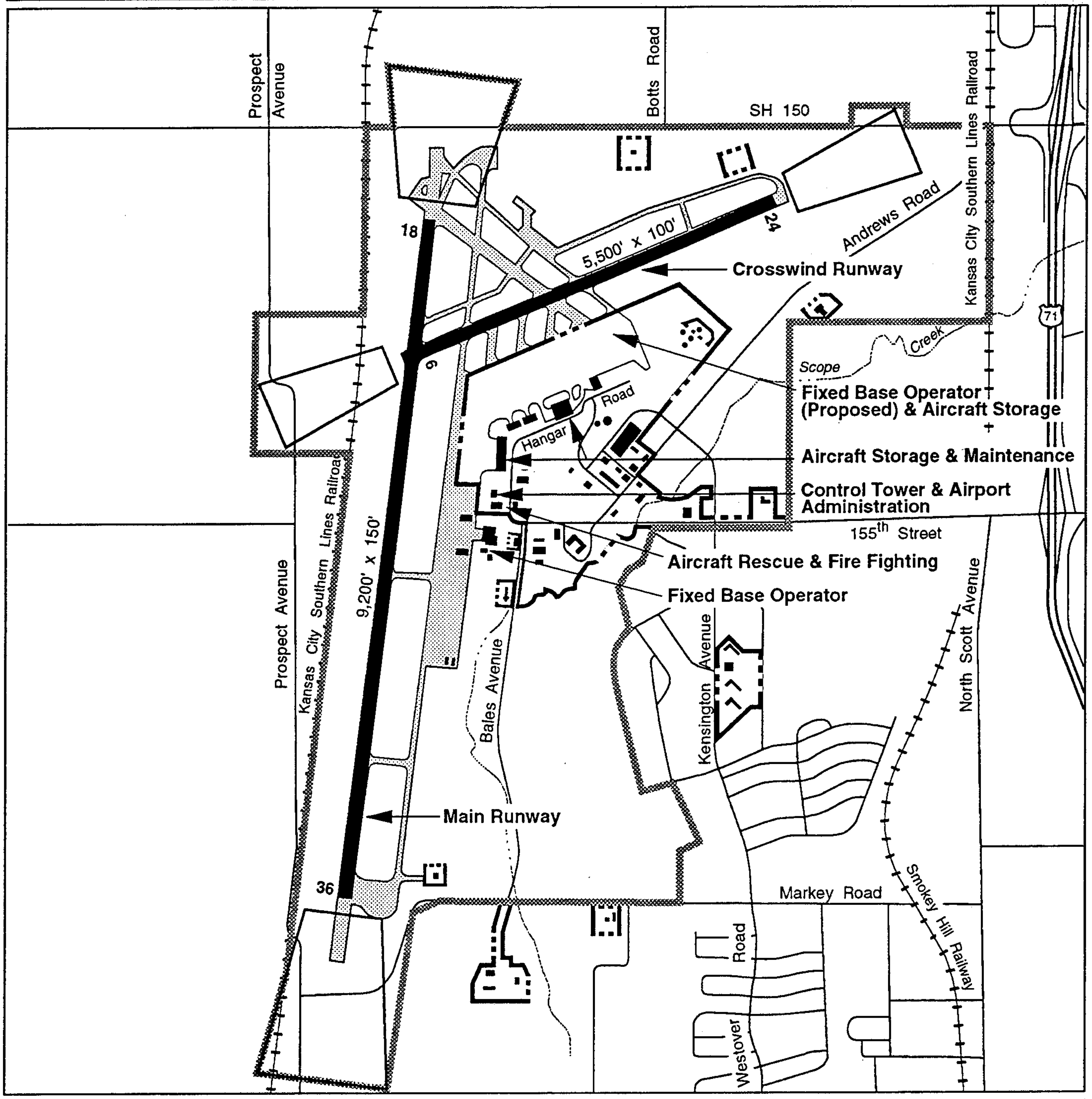
The entire length of Runway 18/36 would be maintained as the main runway at the airport. The precision ILS to Runway 36 would be retained. In addition, the following improvements of the airfield cited in the 1987 study are assumed:

- Replace the tactical air navigation (TACAN) non-precision approaches to Runways 18 and 36, which would cease upon closure, with GPS non-precision approaches.

- Reconstruct and recommission former Runway 6/24 at a length of 5,500 feet and a width of 100 feet to accommodate general aviation aircraft.

- Install precision approach path indicators on Runways 6 and 24.

2.3.1.2 Aviation Support. The aviation support area would encompass 115 acres, or 27 percent of the base property, most of it in the Cantonment Area, east of Runway 18/36. The Air Traffic Transceiver, Fire Training Area, and NDI Laboratory parcels are also identified as aviation support areas. The aviation support land use includes areas for general aviation,



EXPLANATION

- Airport Property Line
- Base Boundary
- Airfield Pavement
- Runway
- Runway Protection Zone

0 500 1000 2000 Feet

Preliminary Airport Layout Plan - Aviation Alternative

Figure 2.3-2

aircraft storage, commercial service, a second FBO, aircraft maintenance, aircraft parking, air cargo, and jet pilot flight training activities.

The aviation support area in the Cantonment Area includes the base operations building/air traffic control tower, fire station, fuel storage facilities, and hangars. The existing flightline hangars would be reused for general aviation aircraft storage and maintenance, and commercial aircraft maintenance. Over the 20-year analysis period, it is anticipated that 57,000 square feet of new hangar space would be constructed. The second FBO would be located within the new hangar space at the north end of the apron. The base operations building would accommodate passenger lounge requirements and airport administration functions. The existing aviation support facilities would be 90 percent utilized within the 20-year analysis period.

2.3.1.3 Industrial. The industrial area covers 84 acres, or 20 percent of the base property. Two industrial areas, totaling 69 acres, are located in the central and eastern portions of the Cantonment Area. These areas contain the telephone exchange, medical clinics, flight simulator, civil engineering, base exchange, post office, and storage buildings; they would be developed for manufacturing, warehouses, and distribution centers. The facilities in the Contracting and Gun Storage parcels would also be used for industrial purposes. In addition, the Small Arms Range, Weapons Bunker, and Mobile Radio Transceiver parcels are identified as industrial areas, assumed to be included as portions of larger industrial development surrounding the base property. Industrial development would begin in 1994 and would be complete by 2004.

2.3.1.4 Residential. Residential areas would cover 197 acres, or 46 percent of the base, within the Billeting Complex and the Belton Training Complex. The Billeting Complex contains three dormitories, a dining facility, a swimming pool, and tennis courts. All facilities would be retained; the dormitories would be converted to 61 apartments. This residential parcel is projected to be completely occupied by 1999.

New housing in the Belton Training Complex would include 61 new single-family residences at a density of three dwelling units per acre. They would be completely developed by 2004.

2.3.1.5 Public Facilities/Recreation. The public facilities/recreation area includes 30 acres, or 7 percent of the base property, in the south portion of the Cantonment Area. A parcel of 6 acres on the north side of 155th Street would include limited recreation facilities, such as picnic facilities or playground equipment, and open park land. The second parcel, south of 155th Street, covers 24 acres and contains the base headquarters, medical facilities, and maintenance facilities. Offices and vehicle maintenance facilities for a public agency such as a city, highway department, or utility district are proposed uses in this area. The recreation facilities adjacent to

Scope Creek would be retained. Limited demolition and no new construction are proposed for this recreation area. Public facilities/recreation reuse would be complete by 1999.

2.3.1.6 Employment and Population. By 2014, the Aviation Alternative would generate site-related employment of 927 direct jobs including construction workers (Table 2.3-5). A total of 251 persons would live in the dormitories in the Billeting Complex and the new houses in the Belton Training Complex.

Table 2.3-5. Site-Related Employment and Population - Aviation Alternative

	Closure	1999	2004	2014
Direct Employment	6	779	955	927
On-Base Population	0	172	251	251

2.3.1.7 Transportation. Existing access roads to base property would continue to be used. A new access would be provided to the Belton Training Complex residential area from Cleveland Avenue (see Figure 2.3-1). Based on land use and employment projections, this alternative would generate an average of 3,850 vehicle trips daily by 2014.

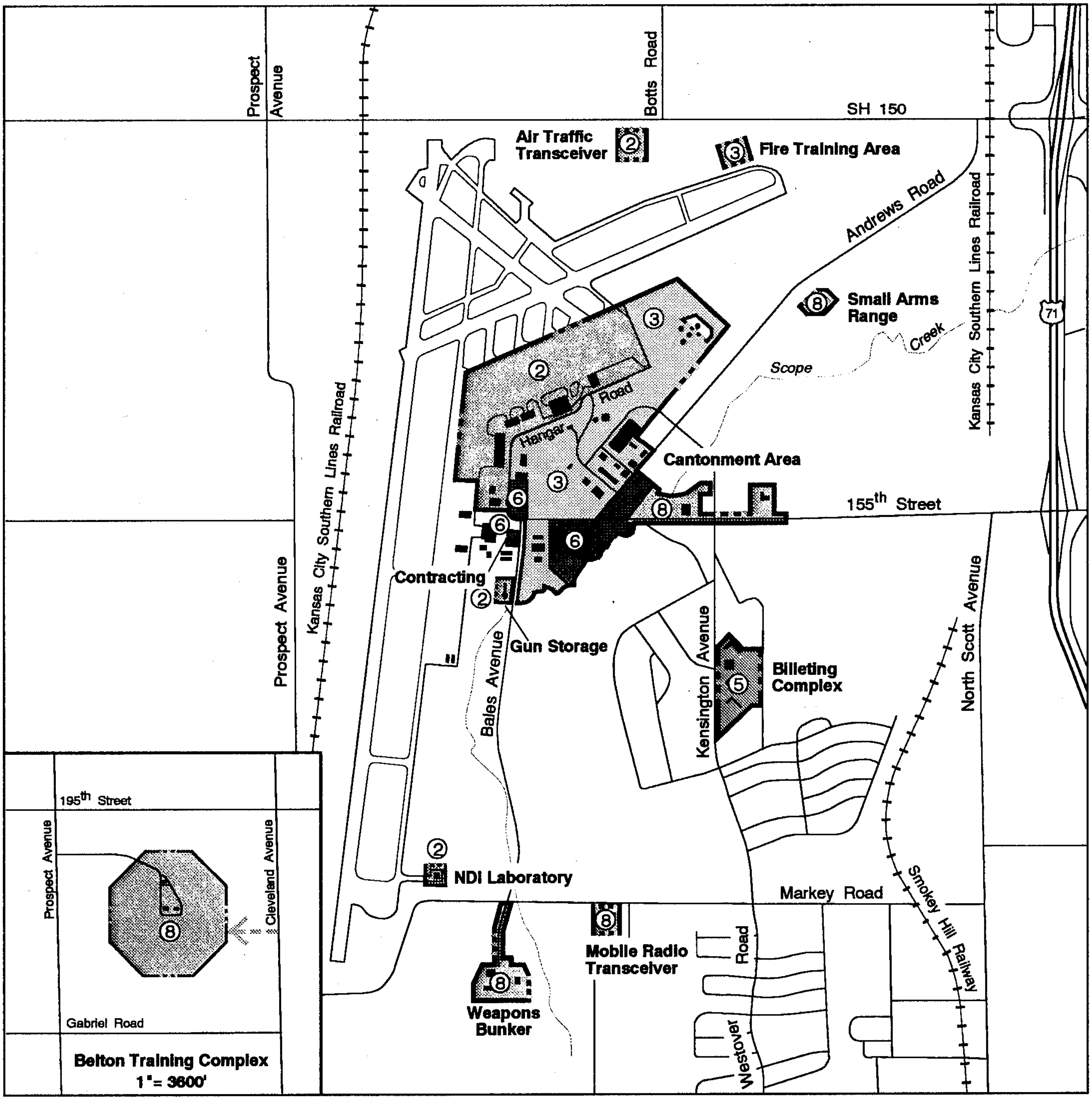
2.3.1.8 Utilities. By 2014, the projected activities associated with the Aviation Alternative would generate the following total utility usage:

- Water - 67,000 GPD
- Wastewater - 84,000 GPD
- Solid Waste - 1.6 tons per day
- Electricity - 24 MWH/day
- Natural Gas - 0.34 MMCF/day.

2.3.2 Aviation with Mixed Use Alternative

The Aviation with Mixed Use Alternative (Figure 2.3-3) proposes a limited general aviation facility, including private pilot flight training, as well as continuing military transient activity. This alternative proposes a smaller aviation support area than the Aviation Alternative but, because of the private aircraft flight training, the total number of annual operations would exceed that of the Aviation Alternative. Large areas are proposed for industrial development and public facilities/recreation uses. Smaller areas would support institutional (educational) and commercial development. The total acreage for each land use category is shown in Table 2.3-6.

The types of assumptions developed in support of the analysis for the Aviation with Mixed Use Alternative are similar to those used for the Aviation Alternative.



EXPLANATION

① Airfield *	⑤ Institutional (Educational)	⑨ Agriculture *
② Aviation Support	⑥ Commercial	Base Boundary
③ Industrial	⑦ Residential *	Proposed Access
④ Institutional (Medical) *	⑧ Public Facilities/ Recreation	

0 500 1000 2000 Feet

* Standard land use designation not applicable to this figure.

Aviation with Mixed Use Alternative

Figure 2.3-3

Table 2.3-6. Land Use Acreage - Aviation with Mixed Use Alternative

Land Use	Acreage
Aviation Support	79
Industrial	100
Institutional	
Educational	13
Commercial	22
Public Facilities/Recreation	212
Total	426

The amount of development through 2014, including existing facility demolition, facility retention, and new facility construction for each land use under the Aviation with Mixed Use Alternative, is provided in Table 2.3-7.

Table 2.3-7. Facility Development - Aviation with Mixed Use Alternative

Land Use	Existing Facility Demolition	Existing Facility Retention	New Facility Construction
	(thousands of square feet of floor space)		
Aviation Support	0	258	0
Industrial	21	186	490
Institutional			
Educational	43	46	0
Commercial	6	74	22
Public Facilities/Recreation	0	39	10
Total	70	603	522

Table 2.3-8 summarizes acreages assumed to be disturbed by construction or other operational activities during each phase of development. The sections below describe activities associated with each land use category.

2.3.2.1 Airfield. The southern 7,000 feet of Runway 18/36 would be maintained and the western section of the crosswind runway would be recommissioned at a length of 4,000 feet (Figure 2.3-4). The airfield would be used for corporate and private aviation as well as private aircraft flight training operations. Although transient military operations would continue at the airport, some aircraft would not be able to land on the shorter runways, so the number of transient operations would decrease from preclosure conditions. Projected operations for the Aviation with Mixed Use Alternative are shown for the years of analysis in Table 2.3-9.

Table 2.3-8. Acres Disturbed - Aviation with Mixed Use Alternative

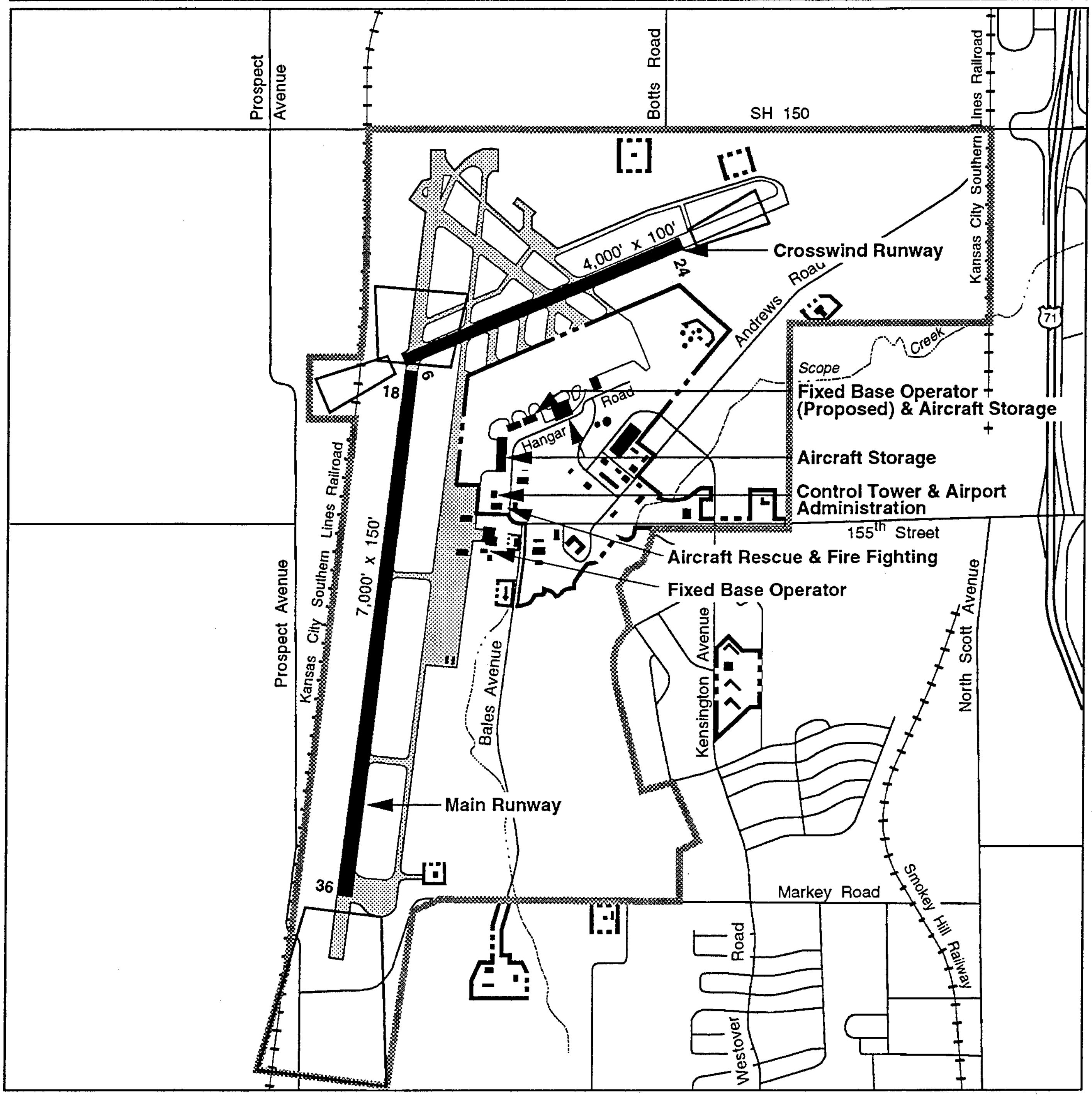
Land Use	Acres Disturbed (by Phase) 1994-1999	1999-2004	2004-2014	Total
Aviation Support	4	1	1	6
Industrial	9	14	16	39
Institutional				
Educational	1	0	0	1
Commercial	4	0	0	4
Public Facilities/Recreation	37	0	0	37
Total	55	15	17	87

Approximately 98 percent of the operations are projected to occur during the daytime hours over the planning period. As in the Aviation Alternative, approximately 80 percent of single-engine operations would use the crosswind runway. All multi-engine and the remainder of the single-engine aircraft operations would use the main runway. As under the Aviation Alternative, it was assumed that 60 percent of operations on the main runway would depart to the south, and 60 percent of operations on the crosswind runway would depart to the southwest.

2.3.2.2 Aviation Support. Aviation support includes areas for general aviation, aircraft storage, aircraft apron parking, and private aircraft flight training. It encompasses 79 acres, or 19 percent of the base property, and includes a portion of the Cantonment Area as well as the Air Traffic Transceiver, Gun Storage, and NDI Laboratory parcels. The aviation support facilities include the base operations building/air traffic control tower, fire station, and hangars. It is assumed that a second FBO would locate on the flightline area along the crosswind runway. Existing facilities would be 95 percent utilized by 2014; no new facility construction is proposed.

2.3.2.3 Industrial. The industrial area covers 100 acres, or 23 percent of the base property, and comprises the Fire Training Area and much of the central portion of the Cantonment Area. The Fire Training Area would be part of a large industrial area that could be developed at the northeastern end of former Runway 6/24. The large industrial parcel contains the base exchange, post office, engineering, administration, and storage and maintenance buildings. Anticipated industrial uses include warehousing, manufacturing, and distribution centers. Industrial development would begin in 1994 and would be complete by 2014.

2.3.2.4 Institutional. The Billeting Complex is the site for the institutional (educational) land use covering 13 acres, or 3 percent of the base. The dormitories, dining facility, pool area, and tennis courts located here would be developed for an institutional retreat or training center accommodating 48



EXPLANATION

Airport Property Line

Base Boundary

Airfield Pavement

Runway

Runway Protection Zone

0 500 1000 2000 Feet

Preliminary Airport Layout Plan - Aviation with Mixed Use Alternative

Figure 2.3-4

Table 2.3-9. Projected Flight Operations - Aviation with Mixed Use Alternative

Year	Activity	Function	FAA Stage	%	Aircraft Operations[a] Fleet Mix	Day	Night	Total
1999	Military	Transient	NA	35	A-10	250	0	250
			NA	20	C-130	141	0	141
			NA	21	T-34/37/43/44	147	0	147
			NA	15	Miscellaneous[b]	110	0	110
			NA	9	Helicopter	66	0	66
	General Aviation	Private Aircraft	NA	81	Single-Engine Piston	40,484	826	41,310
			NA	6	Multi-Engine Piston	2,999	61	3,060
			NA	7.5	Turboprop	3,749	77	3,826
			3	4	Turbojet	1,999	41	2,040
			NA	1.5	Helicopter	750	15	765
	Flight Training	Private Aircraft	NA	75	Single-Engine Piston	8,250	0	8,250
				25	Multi-Engine Piston	2,750	0	2,750
	Total					61,695	1,020	62,715
2004	Military	Transient	NA	35	A-10	250	0	250
			NA	20	C-130	141	0	141
			NA	21	T-34/37/43/44	147	0	147
			NA	15	Miscellaneous[b]	110	0	110
			NA	9	Helicopter	66	0	66
	General Aviation	Private Aircraft	NA	79	Single-Engine Piston	50,323	1,027	51,350
			NA	6	Multi-Engine Piston	3,822	78	3,900
			NA	8	Turboprop	4,937	101	5,038
			3	5	Turbojet	3,344	68	3,412
			NA	2	Helicopter	1,274	26	1,300
	Flight Training	Private Aircraft	NA	75	Single-Engine Piston	11,400	0	11,400
				25	Multi-Engine Piston	3,800	0	3,800
	Total					79,614	1,300	80,914
2014	Military	Transient	NA	35	A-10	250	0	250
			NA	20	C-130	141	0	141
			NA	21	T-34/37/43/44	147	0	147
			NA	15	Miscellaneous[b]	110	0	110
			NA	9	Helicopter	66	0	66
	General Aviation	Private Aircraft	NA	75	Single-Engine Piston	65,415	1,335	66,750
			NA	6	Multi-Engine Piston	5,233	107	5,340
			NA	8	Turboprop	7,196	147	7,343
			3	8	Turbojet	6,760	138	6,898
			NA	3	Helicopter	2,617	53	2,670
	Flight Training	Private Aircraft	NA	75	Single-Engine Piston	12,525	0	12,525
				25	Multi-Engine Piston	4,175	0	4,175
	Total					104,635	1,780	106,415

Notes: (a) An aircraft operation is one takeoff or one landing.
(b) Includes small numbers of operations by C-9, C-12, C-21, and P-3 aircraft.
FAA = Federal Aviation Administration.
NA = not applicable.

people. Two of the three dormitories would be demolished; no new construction is planned. Development and use of the educational facilities would be complete by 1999.

2.3.2.5 Commercial. The areas proposed for commercial reuse cover 22 acres, or 5 percent of the base acreage, in three parcels. Security police and base commander offices are on the northwest corner of 155th Street and Bales Avenue. Existing facilities in both of these areas would be reused as office and administrative space. The large commercial parcel in the southern part of the Cantonment Area includes the base headquarters building, medical evacuation offices, and medical and dental clinics. Existing facilities would be reused for office space, and a small retail complex of convenience stores would be developed at the intersection of 155th Street and Andrews Road. The facilities in the Contracting parcel are also proposed for commercial (office) use. Commercial development could begin soon after disposal of the property and would be complete by 1999.

2.3.2.6 Public Facilities/Recreation. The proposed public facilities/ recreation areas consist of 212 acres, or 50 percent of the base property. This area includes the Small Arms Range, the easternmost section of the Cantonment Area, the Weapons Bunker, the Mobile Radio Transceiver, and the Belton Training Complex. The Small Arms Range would be reused for training by local law enforcement agencies. The east section of the Cantonment Area, containing the telephone exchange and the former flight simulator building, would be reused for public agency offices. The Weapons Bunker and the Mobile Radio Transceiver parcels would be part of a larger recreational area that could be developed south of Markey Road, possibly as an extension of the existing golf course on the north side of the road. The Belton Training Complex would be used as a regional park. Public facilities/ recreation reuse would be complete by 1999.

2.3.2.7 Employment and Population. By 2014, the Aviation with Mixed Use Alternative would generate a total of 1,109 direct jobs, including construction workers (Table 2.3-10). There would be no residential land uses and, thus, no permanent population associated with reuse of base property.

Table 2.3-10. Site-Related Employment - Aviation with Mixed Use Alternative

	Closure	1999	2004	2014
Direct Employment	6	668	880	1,109

2.3.2.8 Transportation. As under the Aviation Alternative, existing transportation access points to the base property would continue to be used, and an access to the Belton Training Complex would be provided from Cleveland Avenue (see Figure 2.3-3). Based on land use and employment

projections, this alternative would generate an average of 5,300 vehicle trips daily by 2014.

2.3.2.9 Utilities. By 2014, the projected activities associated with the Aviation with Mixed Use Alternative would generate the following total utility usage:

- Water - 43,000 GPD
- Wastewater - 54,000 GPD
- Solid Waste - 1.2 tons per day
- Electricity - 28 MWH/day
- Natural Gas - 0.32 MMCF/day.

2.3.3 Industrial Alternative

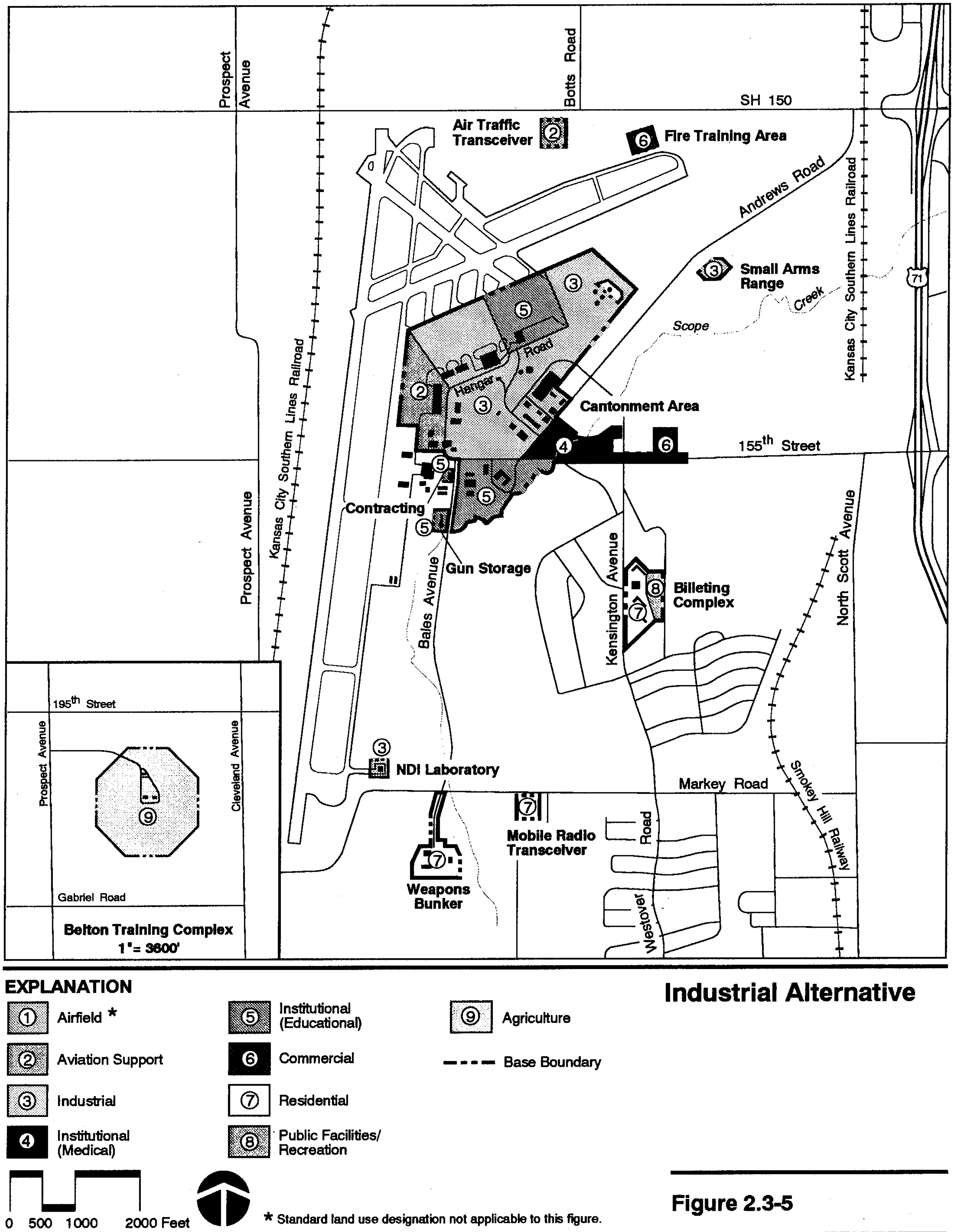
The Industrial Alternative (Figure 2.3-5) assumes that more than half of the Cantonment Area would be used for industrial development. The remaining portions of base property would be developed for aviation support, institutional, commercial, residential, public facilities/recreation, and agricultural uses. The total acreage for each land use category is shown in Table 2.3-11.

Table 2.3-11. Land Use Acreage - Industrial Alternative

Land Use	Acreage
Aviation Support	25
Industrial	125
Institutional	
Medical	16
Educational	46
Commercial	6
Residential	19
Public Facilities/Recreation	5
Agriculture	184
Total	426

The types of assumptions developed in support of the analysis for the Industrial Alternative were similar to those used for the Aviation and Aviation with Mixed Use alternatives.

The amount of development through 2014, including existing facility demolition, facility retention, and new facility construction, for each land use under the Industrial Alternative is provided in Table 2.3-12.



Industrial Alternative

Figure 2.3-5

Table 2.3-12. Facility Development - Industrial Alternative

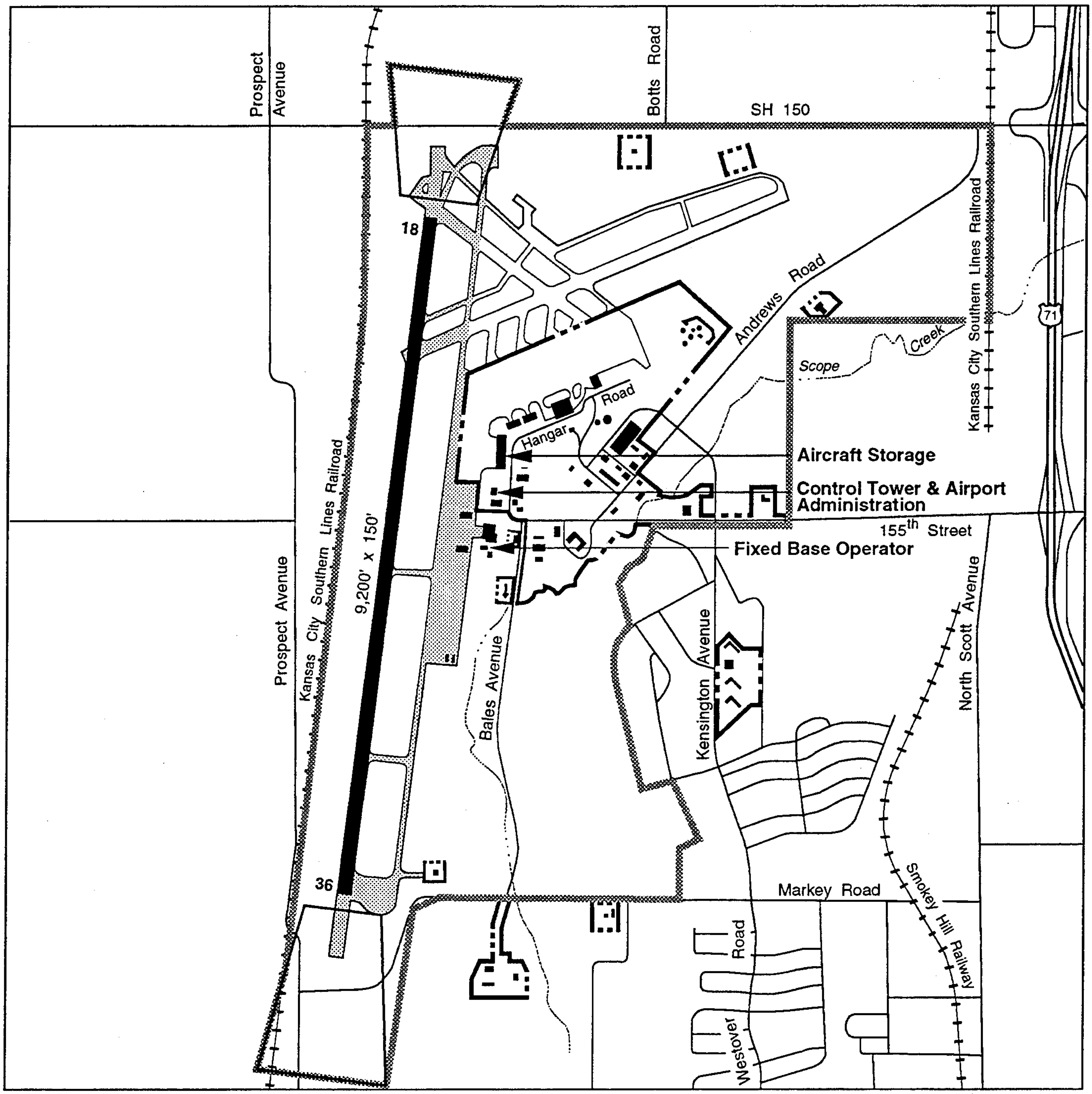
Land Use	Existing Facility Demolition	Existing Facility Retention	New Facility Construction
	(thousands of square feet of floor space)		
Aviation Support	0	94	0
Industrial	15	309	447
Institutional			
Medical	6	27	0
Educational	2	110	0
Commercial	0	6	22
Residential	33	67	69
Public Facilities/Recreation	0	1	0
Agriculture	0	3	0
Total	56	617	538

Table 2.3-13 summarizes acreages assumed to be disturbed by construction or other operational activities during each phase of development. The sections below describe activities associated with each land use category.

Table 2.3-13. Acres Disturbed - Industrial Alternative

	Acres Disturbed (by Phase)			
Land Use	1994-1999	1999-2004	2004-2014	Total
Aviation Support	2	0	0	2
Industrial	10	12	18	40
Institutional				
Medical	2	0	0	2
Educational	5	0	0	5
Commercial	2	0	0	2
Residential	3	8	0	11
Public Facilities/ Recreation	5	0	0	5
Agriculture	36	0	0	36
Total	65	20	18	103

2.3.3.1 Airfield. Runway 18/36 would be maintained at its present length and configuration, but the crosswind runway would remain closed (Figure 2.3-6). The airfield would be used for corporate and private aviation, as well as for transient military activity. Projected aircraft operations for the Industrial Alternative are shown for the years of analysis in Table 2.3-14. Approximately 98 percent of the operations are projected to occur during daytime hours over the planning period. It is assumed that 60 percent of



EXPLANATION

Airport Property Line

Airfield Pavement

Runway

Runway Protection Zone

Base Boundary

0 500 1000 2000 Feet

Preliminary Airport Layout Plan - Industrial Alternative

Figure 2.3-6

Table 2.3-14. Projected Flight Operations - Industrial Alternative

Year	Activity	Function	FAA Stage	%	Fleet Mix	Aircraft Operations[a] Day	Night	Total
1999	Military	Transient	NA	25	A-10	250	0	250
			NA	14	C-130/141	141	0	141
			NA	31	T-34/37/38/43/44	312	0	312
			NA	23	Miscellaneous[b]	232	0	232
			NA	7	Helicopter	66	0	66
	General Aviation	Private Aircraft	NA	80	Single-Engine Piston	35,280	720	36,000
			NA	6	Multi-Engine Piston	2,646	54	2,700
			NA	8	Turboprop	3,528	72	3,600
			3	4	Turbojet	1,764	36	1,800
			NA	2	Helicopter	882	18	900
	Total					45,101	900	46,001
2004	Military	Transient	NA	25	A-10	250	0	250
			NA	14	C-130/141	141	0	141
			NA	31	T-34/37/38/43/44	312	0	312
			NA	23	Miscellaneous[b]	232	0	232
			NA	7	Helicopter	66	0	66
	General Aviation	Private Aircraft	NA	79	Single-Engine Piston	41,033	837	41,870
			NA	6	Multi-Engine Piston	3,116	64	3,180
			NA	8	Turboprop	4,155	85	4,240
			3	5	Turbojet	2,597	53	2,650
			NA	2	Helicopter	1,039	21	1,060
	Total					52,941	1,060	54,001
2014	Military	Transient	NA	25	A-10	250	0	250
			NA	14	C-130/141	141	0	141
			NA	31	T-34/37/38/43/44	312	0	312
			NA	23	Miscellaneous[b]	232	0	232
			NA	7	Helicopter	66	0	66
	General Aviation	Private Aircraft	NA	75	Single-Engine Piston	55,125	1,125	56,250
			NA	6	Multi-Engine Piston	4,410	90	4,500
			NA	8	Turboprop	6,064	124	6,188
			3	8	Turbojet	5,696	116	5,812
			NA	3	Helicopter	2,205	45	2,250
	Total					74,501	1,500	76,001

Notes: (a) An aircraft operation is one takeoff or one landing.
(b) Includes small number of operations by A-3, A-4, A-6, A-7, C-5, C-7, C-9, C-12, C-21, F-4, F-5, F-14, F-15, F-16, F-18, F-27, KC-10, KC-135, and P-3 aircraft.
FAA = Federal Aviation Administration.
NA = not applicable.

operations would depart to the south. The existing airfield would be adequate to accommodate the projected aviation demand.

2.3.3.2 Aviation Support. The aviation support land use includes areas for general aviation and aircraft storage. It encompasses 25 acres, or 6 percent of the base property, and is located within the Cantonment Area and the Air Traffic Transceiver parcel. The aviation support facilities include the base operations building/air traffic control tower, fire station, and a hangar. The control tower, as in the other plans, would continue its present use. The fire station would be converted for storage and office uses. The hangar, which is located near the existing FBO, would be reused for aircraft storage. No new aviation support construction is proposed. Reuse of existing facilities would occur in the first 5 years after base closure.

2.3.3.3 Industrial. The proposed industrial land use area covers 125 acres, or about 29 percent of the base property. The Small Arms Range, over half of the Cantonment Area (122 acres), and the NDI Laboratory are included in this land use category. The industrial area in the Cantonment Area includes the base exchange, post office, base commander's office, civil engineering, and storage facilities. New industrial uses in all three areas would include manufacturing, warehousing, and distribution centers. The Small Arms Range would be converted to industrial uses as part of anticipated surrounding development. The industrial use areas would be completely utilized by 2014.

2.3.3.4 Institutional. The institutional land use area covers 62 acres, or 15 percent of the base property, in five parcels. The 16-acre parcel at the intersection of 155th Street and Andrews Road contains medical offices and clinics and the former flight simulator building. Reuse as a medical complex, including offices, clinics, and rehabilitation services is proposed for this parcel. A 20-acre parcel south of the crosswind runway includes the fuel management building and maintenance facilities; the parcel south of 155th Street covers 24 acres and includes medical buildings, base headquarters, and storage facilities. Possible uses for both of these parcels include some type of driver training center, for example, truck driver or police officer road training. The concrete apron area near the flightline could be used for road training, and the facilities south of 155th Street could be used for vehicle storage and maintenance and office functions. Facilities in the Contracting and Gun Storage parcels (2 acres) are also proposed for use in conjunction with the driver training center. Institutional development would be complete within 5 years after closure.

2.3.3.5 Commercial. The commercial area includes 6 acres, or 1 percent of the area, in the Fire Training Area and the eastern section of the Cantonment Area. The Fire Training Area would be part of a surrounding retail development that could occur along Missouri Highway (M)-150 north of the base. The eastern section of the Cantonment Area, which includes the telephone exchange, would be developed for office uses. Development in both areas would be completed in the first 5 years after closure.

2.3.3.6 Residential. The residential reuse area encompasses 19 acres, or 5 percent of the area, and includes the west section of the Billeting Complex, the Weapons Bunker, and the Mobile Radio Transceiver. One of the three dormitories in the Billeting Complex would be demolished and the others would be converted to 38 residential apartments. The dining facility would be retained as a recreational or community center serving the residents of the complex. The Weapons Bunker and the Mobile Radio Transceiver are assumed to be included within a larger residential area that could be developed south of Markey Road, at a density of five dwelling units per acre, similar to surrounding residential development. All of the residential units would be occupied by 2004.

2.3.3.7 Public Facilities/Recreation. The only public facilities/recreation area contains the tennis courts and swimming pool in the east section of the Billeting Complex. These facilities, covering 5 acres, or about 1 percent of the base property, would be used as ancillary facilities to support the adjacent residential use. No demolition is planned. Reuse of the facilities would occur within 5 years after closure.

2.3.3.8 Agriculture. Agricultural reuse is proposed for the 184-acre Belton Training Complex (43 percent of the base). The existing grassland areas would be used for grazing or, where the topography is suitable, for fodder production. No facilities would be demolished. Reuse would be complete by 1999.

2.3.3.9 Employment and Population. By 2014, the Industrial Alternative would include a total site-related employment of 917 direct jobs, including construction workers (Table 2.3-15). A total of 200 persons would live in the apartments in the Billeting Complex and the new homes in the Weapons Bunker and Mobile Radio Transceiver parcels.

Table 2.3-15. Site-Related Employment and Population - Industrial Alternative

	Closure	1999	2004	2014
Direct Employment	6	413	678	917
On-Base Population	0	53	200	200

2.3.3.10 Transportation. Existing access roads to base property would continue to be used. No new access roads are proposed. Based on land use and employment projections, this alternative would generate an average of 3,950 vehicle trips daily by 2014.

2.3.3.11 Utilities. By 2014, the projected activities associated with the Industrial Alternative would generate the following utility usage:

- Water - 59,000 GPD
- Wastewater - 73,000 GPD
- Solid Waste - 1.0 tons per day
- Electricity - 28 MWH/day
- Natural Gas - 0.36 MMCF/day.

2.3.4 No-Action Alternative

The No-Action Alternative would result in the U.S. government retaining ownership of the base property after closure. The property would not be put to further use. The base would be preserved, i.e., placed in a condition intended to limit deterioration and ensure public safety. Caretaker activities would consist of base resource protection, grounds maintenance, operation of existing utilities as necessary, and building care. No other military activities/missions are anticipated to be performed on the property. The control tower and fire station would be operated by the KCAD as required to support civilian airport activities.

The future land uses and levels of maintenance on base property would be as follows:

- Maintain structures to limit deterioration

- Isolate or deactivate utility distribution lines on base

- Provide limited maintenance of roads to ensure access

- Provide limited grounds maintenance of open areas to eliminate fire, health, and safety hazards.

Because the airfield is owned by the KCAD and is not part of Air Force property to be disposed, civilian operations at Richards-Gebaur Airport would continue under the No-Action Alternative. It is assumed that only the main runway would be used, as under preclosure and closure conditions. Civilian aircraft activity levels are expected to be similar to those projected at closure and would probably increase over the next 20 years as a result of general growth in the region, even without the addition of Air Force property. Further, it would be difficult to project the difference in aviation operations growth with and without base disposal and reuse. For these reasons, and because the Air Force contribution to aviation operations (and associated environmental impacts) at Richards-Gebaur Airport has been small, it has been assumed for the purposes of this environmental analysis that all growth is associated with reuse, and impacts are analyzed for total (cumulative) projected aviation activities.

2.4 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

No other alternatives were examined and eliminated from further consideration. No other reuse proposals have been submitted for Richards-Gebaur AFB.

2.5 INTERIM USES

Interim uses include pre-disposal short-term uses of the base facilities and property. Pre-disposal interim uses are conducted under lease agreements with the Air Force. The terms and conditions of the leases would be arranged to ensure that the pre-disposal interim uses do not prejudice future disposal and reuse plans of the base. The continuation of interim uses beyond disposal would be arranged through agreements with the new property owner(s). The Air Force is preparing a government permit granting the U.S. Marine Corps interim use of 16 facilities, pending completion of permanent transfer. Facility uses for administrative, training, storage, medical and dental clinic, maintenance shops, open mess, dormitories, and recreational functions will be the same as current uses. The Assistant Secretary of Defense for Economic Security approved the permanent transfer of real property to the U.S. Marine Corps on June 2, 1994. These uses are those discussed in Section 2.2.6, Military, under the Proposed Action; therefore, no further environmental analysis is required.

A zero baseline representing conditions at the point of closure is used for the environmental analysis. Pre-disposal interim uses are not considered in the baseline conditions used for the environmental analysis because the baseline captures the future conditions at the point of closure and does not presuppose a decision of continued interim uses at that time.

2.6 OTHER FUTURE ACTIONS IN THE REGION

Other actions planned for the vicinity of the base that could result in cumulative impacts include the upgrading and realignment of M-150 north and west of the base and the development of the base property previously disposed to Kansas City. Improvement of M-150 near the base is projected to occur by 1999, and is addressed in Chapter 4 as a potential source of cumulative impacts where appropriate. Details of the phasing and development of the area surrounding the base are not known and cumulative impacts cannot be quantified.

2.7 COMPARISON OF ENVIRONMENTAL IMPACTS

A summary comparison of the influencing factors and environmental impacts, along with their potential mitigation, for each biophysical resource affected by the Proposed Action and reasonable alternatives over the 20-year study period is presented in Tables 2.7-1 and 2.7-2. Impacts for air quality are summarized over a 10-year period due to the speculative nature

Table 2.7-1. Summary of Reuse-Related Influencing Factors

Factor	Proposed Action 1999	Proposed Action 2004	Proposed Action 2014	Aviation Alternative 1999	Aviation Alternative 2004	Aviation Alternative 2014	Aviation with Mixed Use Alternative 1999	Aviation with Mixed Use Alternative 2004	Aviation with Mixed Use Alternative 2014	Industrial Alternative 1999	Industrial Alternative 2004	Industrial Alternative 2014	No-Action Alternative[a]
Ground disturbance (acres by phase)	22	20	41	38	32	10	55	15	17	65	20	18	0
Aircraft operations (annual)	58,000	78,000	114,000	54,042	70,081	96,122	62,715	80,914	106,415	46,001	54,001	76,001	0
Direct employment	565	869	1,475	773	949	921	662	874	1,103	407	672	911	0
Local transfers	549	837	1,413	735	902	875	629	831	1,048	388	640	866	0
New jobs	16	32	62	38	47	46	33	43	55	19	32	45	0
Secondary employment	521	869	1,570	870	1,058	1,017	838	1,057	1,308	466	751	1,006	0
Local transfers	517	861	1,555	861	1,047	1,006	829	1,046	1,295	461	743	996	0
New jobs	4	8	15	9	11	11	9	11	13	5	8	10	0
Population in-migration	58	116	225	137	169	166	122	157	198	70	116	160	0
Traffic (total daily trips)	1,700	2,900	5,300	2,800	3,650	3,850	4,000	4,600	5,300	2,050	3,300	3,950	0
Increase in ROI water demand (MGD)	0.093	0.186	0.371	0.064	0.089	0.092	0.043	0.057	0.073	0.031	0.066	0.083	0
Increase in ROI wastewater production (MGD)	0.085	0.169	0.338	0.072	0.102	0.106	0.047	0.063	0.080	0.035	0.076	0.094	0
Increase in ROI solid waste generation (tons/day)	1.75	3.51	7.00	1.64	2.02	2.02	1.28	1.47	1.70	0.64	1.20	1.44	0
Increase in ROI electricity demand (MWH/day)	19.00	38.01	75.95	16.57	23.91	25.53	16.05	22.04	29.30	13.92	22.63	29.29	0
Increase in ROI natural gas demand (MMCF/day)	0.24	0.47	0.94	0.23	0.34	0.35	0.20	0.27	0.35	0.18	0.31	0.38	0

Note: (a) The No-Action Alternative values summarize influencing factors relative to the projected closure conditions for each period of analysis.
MGD = million gallons per day.
MMCF/day = million cubic feet per day.
MWH/day = megawatt-hours per day.
ROI = Region of Influence.

Table 2.7-2. Summary of Environmental Impacts and Suggested Mitigations from the Reuse Alternatives
Page 1 of 5

Resource Category	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative	No-Action Alternative
Local Community					
• Land Use and Aesthetics	• **Impacts:** No impacts.	• **Impacts:** No impacts.	• **Impacts:** No impacts.	• **Impacts:** No impacts.	• **Impacts:** Potential conflict with regional development goals.
• Transportation	• **Impacts:** Reuse-related traffic increases would not result in unacceptable levels of service on local roadways. No airspace conflicts. Possible loss of commuter passenger service to Kansas City Downtown Airport.	• **Impacts:** Traffic increases similar to the Proposed Action. No airspace conflicts. Possible loss of commuter passenger service to Kansas City Downtown Airport.	• **Impacts:** Traffic increase similar to the Proposed Action. No airspace conflicts.	• **Impacts:** Traffic increase similar to the Proposed Action. No airspace conflicts.	• **Impacts:** Reduced LOS on regional and local roadways as a result of baseline population and employment growth.
• Utilities	• **Impacts:** Possible increase in quantities and types of industrial wastewater discharge.	• **Impacts:** Possible increase in quantities and types of industrial wastewater discharge. Belton Training Complex is not currently served by utilities. Extension of distribution lines, individual facility metering, and utility corridors and easements would be required for electrical and natural gas systems.	• **Impacts:** Similar to Aviation Alternative.	• **Impacts:** Similar to Aviation Alternative.	• **Impacts:** Disuse may result in degradation over the long term.
	• **Mitigations:** New users may have to provide pretreatment and obtain permits for industrial wastewater discharge.	• **Mitigations:** Pretreatment and permits may be required for industrial wastewater, similar to Proposed Action. Water, wastewater, and natural gas services would have to be provided at Belton Training Complex.	• **Mitigations:** Pretreatment and permits may be required for industrial wastewater, similar to Proposed Action. Water and wastewater services would have to be provided to Belton Training Complex.	• **Mitigations:** Pretreatment and permits may be required for industrial wastewater, similar to Proposed Action. Water would have to be provided to Belton Training Complex.	

LOS = level of service.

Table 2.7-2. Summary of Environmental Impacts and Suggested Mitigations from the Reuse Alternatives

Resource Category	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative	No-Action Alternative
Hazardous Materials and Hazardous Waste Management					
• Hazardous Materials Management	• **Impacts:** Moderate increase in types and quantities of materials. No impact with proper management.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Small quantities used by OL. No impact with proper management.
• Hazardous Waste Management	• **Impacts:** Moderate increase in types and quantities of wastes. No impact with proper management.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Small amounts generated by OL. No impact with proper management.
• Storage Tanks	• **Impacts:** No impact. All USTs to be removed. Aboveground tanks to be closed in place or managed according to applicable regulations.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** No impact. Tanks removed or properly closed.
• Asbestos	• **Impacts:** Removal and disposal of ACM in facilities to be demolished. Remaining asbestos will require management in place.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Continued management of facilities with ACM.
• Pesticide Usage	• **Impacts:** Moderate increase in use due to new development. No impact if managed in accordance with applicable regulations.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Minimal use by OL as part of caretaker activities. No impact.
• PCBs	• **Impacts:** No impact. No regulated PCBs are on base.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** No impact. No regulated PCBs are on base.

ACM = asbestos-containing material.
OL = Operating Location.
PCB = polychlorinated biphenyl.
UST = underground storage tank.

Table 2.7-2. Summary of Environmental Impacts and Suggested Mitigations from the Reuse Alternatives
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Resource Category	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative	No-Action Alternative
Hazardous Materials and Hazardous Waste Management (Continued)					
• Radon	• **Impacts:** Levels may exceed 4 pCi/l. Dormitories should be tested.	• **Impacts:** Levels may exceed 4 pCi/l. Dormitories should be tested. Residential construction design should incorporate features to reduce risk.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Aviation Alternative.	• **Impacts:** No impact.
• Medical/Biohazardous Waste	• **Impacts:** No impact. Small quantities generated by clinic.	• **Impacts:** No impact. None generated.	• **Impacts:** Same as Aviation Alternative.	• **Impacts:** Same as Proposed Action.	• **Impacts:** No impact. None generated.
• Ordnance	• **Impacts:** No impact. Ordnance removed from Weapons Bunker prior to closure. Soil contamination at Small Arms Range below action levels.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action. Reuse of Small Arms Range could cause lead contamination in soils.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.
• Lead-Based Paint	• **Impacts:** Possible exposure to lead-based paint in facilities built before 1978. • **Mitigations:** Disclose possible presence of lead-based paint to new owners.	• **Impacts:** Similar to Proposed Action. • **Mitigations:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action. • **Mitigations:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action. • **Mitigations:** Similar to Proposed Action.	• **Impacts:** No impacts. OL would maintain buildings with lead-based paint.
Natural Environment					
• Geology and Soils	• **Impacts:** Short-term soil erosion due to construction. No impacts to prime farmlands.	• **Impacts:** Severe restrictions in siting sanitary facilities due to unsuitable soils. Short-term soil erosion due to construction. Minimal level of consideration required for loss of prime farmland.	• **Impacts:** Minimal impact due to siting sanitary facilities in unsuitable soils. Short-term soil erosion due to construction. Minor impacts to prime farmland.	• **Impacts:** Short-term soil erosion due to construction. Beneficial impacts to farmlands.	• **Impacts:** No impacts.

OL = Operating Location.
pCi/l = picocuries per liter.

Table 2.7-2. Summary of Environmental Impacts and Suggested Mitigations from the Reuse Alternatives
Page 4 of 5

Resource Category	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative	No-Action Alternative
Natural Environment (Continued)					
	• **Mitigations:** Use techniques such as protective cover and diversion dikes to minimize erosion during and after construction.	• **Mitigations:** Use techniques such as protective cover and diversion dikes to minimize erosion during and after construction. Connect to sanitary sewer system or perform geologic and soil studies, and design facilities to optimize effectiveness of septic system while minimizing impacts.	• **Mitigations:** Similar to Aviation Alternative.	• **Mitigations:** Similar to Proposed Action.	
• Water Resources	• **Impacts:** Negligible increase in ROI water demand would not affect water supply. Minimal runoff effects.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** No impact.
• Air Quality	• **Impacts:** Increased regional and local emissions will not exceed NAAQS or PSD Class II standards.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Less than under reuse alternatives.
• Noise	• **Impacts:** No residents exposed to DNL 65 dB or greater from aircraft operations. No increase in number of people exposed to DNL 65 dB or greater from reuse-related surface traffic.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** No residents exposed to DNL 65 dB or greater from aircraft operations. Increase of 126 people exposed to DNL 65 dB or greater from surface traffic noise as a result of baseline growth in the ROI from 1994 to 2014.

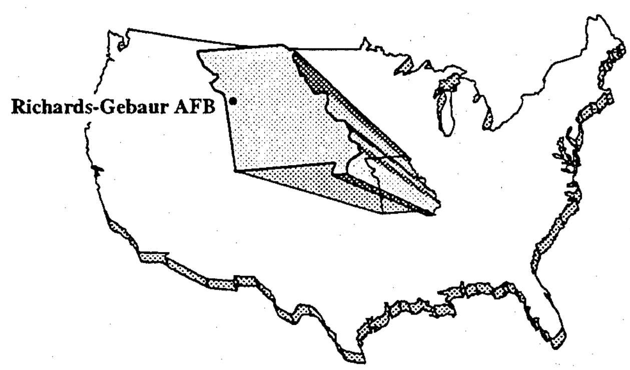
dB = decibel.
DNL = day-night average noise level.
NAAQS = National Ambient Air Quality Standards.
PSD = Prevention of Significant Deterioration.
ROI = Region of Influence.

Table 2.7-2. Summary of Environmental Impacts and Suggested Mitigations from the Reuse Alternatives

Resource Category	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative	No-Action Alternative
Natural Environment (Continued)					
• Biological Resources	• **Impacts:** No threatened or endangered species. Possible impacts to 0.6 acre of jurisdictional wetlands along drainages.	• **Impacts:** No threatened or endangered species. Possible impacts to 0.8 acre of jurisdictional wetlands along drainages.	• **Impacts:** Similar to Aviation Alternative.	• **Impacts:** Similar to Aviation Alternative.	• **Impacts:** Potential increase in habitat value due to long-term decreases in human activity.
	• **Mitigations:** Avoid wetlands impacts through facility redesign, restrictions in transfer documents, and controlling runoff from construction sites.	• **Mitigations:** Similar to Proposed Action.	• **Mitigations:** Similar to Proposed Action.	• **Mitigations:** Similar to Proposed Action.	
• Cultural Resources	• **Impacts:** No prehistoric or historic archaeological, traditional, or paleontological sites are present. Potential impact to one historic property on base due to loss of federal protection.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Similar to Proposed Action.	• **Impacts:** Federal protection remains. The OL would continue Building 602 preservation maintenance.
	• **Mitigations:** Properties may be conveyed to nonfederal owners with preservation covenants. SHPO and Advisory Council would be consulted during development and implementation of procedures and mitigation strategies. Prepare agreement document to establish acceptable mitigation measures.	• **Mitigations:** Similar to Proposed Action.	• **Mitigations:** Similar to Proposed Action.	• **Mitigations:** Similar to Proposed Action.	

OL = Operating Location.
SHPO = State Historic Preservation Officer.

of predicting pollutant emissions and concentrations far into the future under changing regulatory and climatic conditions (see Section 4.4.3). Table 2.7-2 also includes a summary of closure baseline conditions to provide a basis for comparison of reuse-related changes and associated impacts. Influencing factors are non-biophysical elements, such as population, employment, land use, aesthetics, public utility systems, and transportation networks that directly impact the environment. These activities have been analyzed to determine their effects on the environment. Impacts to the environment are described briefly in the summary and discussed in detail in Chapter 4.



CHAPTER 3
AFFECTED ENVIRONMENT

3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

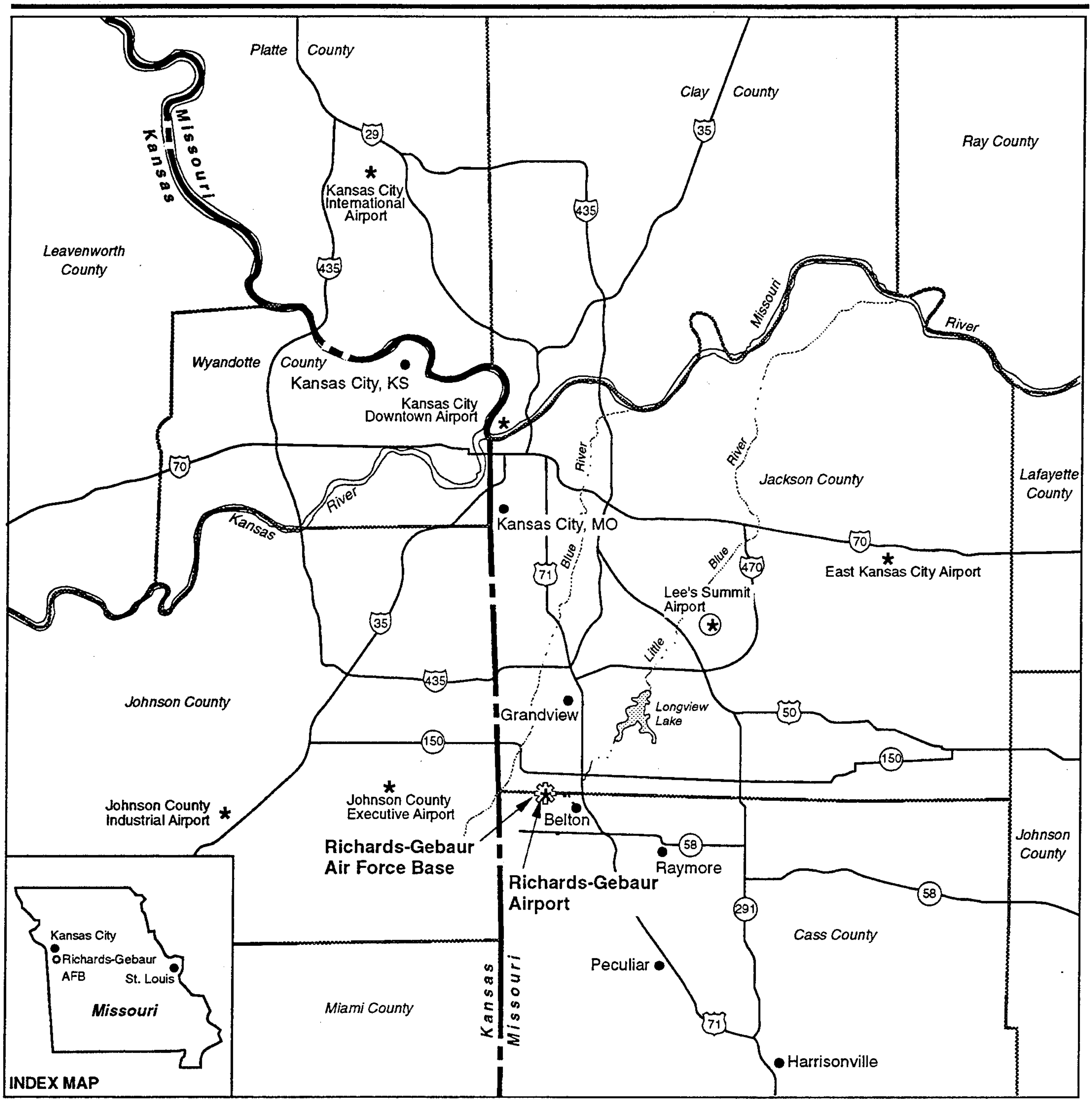
This chapter describes the environmental conditions of Richards-Gebaur AFB and its ROI as it would be at the time of base closure. It provides information to serve as a baseline from which to identify and evaluate environmental changes resulting from disposal and reuse of Richards-Gebaur AFB. Although this EIS focuses on the biophysical environment, some non-biophysical elements are addressed. The non-biophysical elements (influencing factors) of population and employment, land use and aesthetics, transportation networks, and public utility systems in the region and local communities are addressed. This chapter also describes the storage, use, and management of hazardous materials/wastes found on base, including storage tanks, asbestos, pesticides, polychlorinated biphenyls (PCBs), radon, medical/biohazardous waste, ordnance, and lead-based paint. The current status of the IRP is also described. Finally, the chapter describes the pertinent natural resources of geology and soils, water resources, air quality, noise, biological resources, and cultural resources.

The ROI to be studied will be defined for each resource area affected by the alternatives. The ROI determines the geographical area to be addressed as the Affected Environment. Although the base boundary may constitute the ROI limit for many resources, potential impacts associated with certain issues (e.g., air quality, utility systems, and water resources) transcend these limits.

The baseline conditions assumed for the purposes of analysis are the conditions projected at base closure in September 1994. Impacts associated with disposal and/or reuse activities may then be addressed by comparing projected conditions under various reuses to closure conditions. A reference to preclosure conditions is provided, where appropriate (e.g., air quality) in this document, in order to provide a comparative analysis over time. Data used to describe the preclosure reference point are those that depict conditions as close as possible to the closure announcement date. This will assist the decision maker and agencies in understanding potential long-term impacts in comparison to conditions when the installation was active.

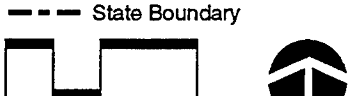
3.2 LOCAL COMMUNITY

Richards-Gebaur AFB is in west-central Missouri, approximately 3 miles from the Kansas state line (Figure 3.2-1). The base property is almost equally divided in half by the Jackson and Cass County line, running east-west. To the north, in Jackson County, the base is bordered by Kansas City, with the



EXPLANATION

- ★ Major Airports
- (35) Interstate Highway
- (71) U.S. Highway
- (150) State Highway
- County Boundary
- State Boundary



Regional Map

Figure 3.2-1

city of Grandview to the northeast (Figure 3.2-2). To the east and south, in Cass County, is the city of Belton. The areas west of the airfield, north of the Mobile Radio Transceiver, and surrounding the Belton Training Complex are unincorporated portions of Cass County.

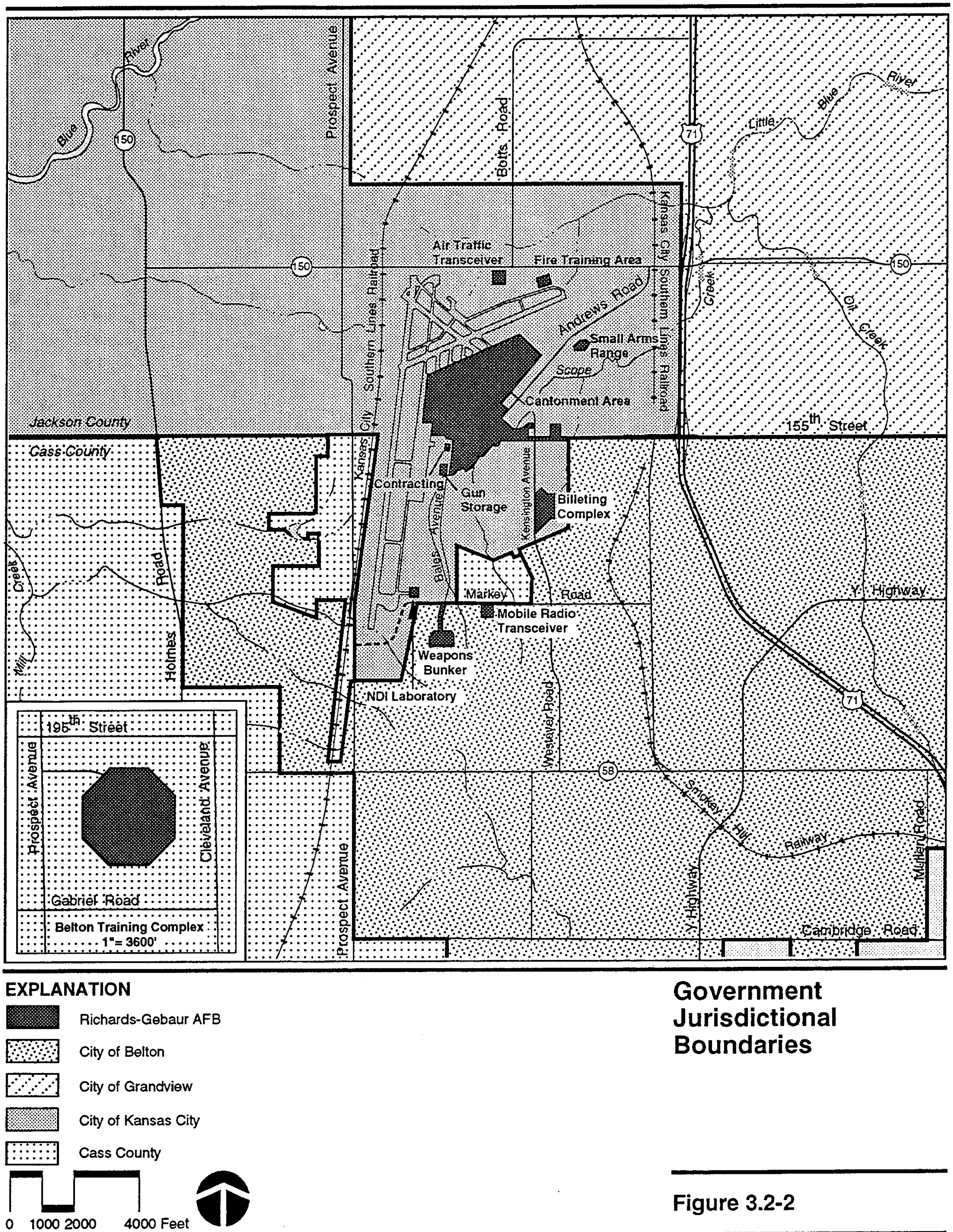
Richards-Gebaur AFB encompasses 426 acres on 11 non-contiguous parcels (see Figure 2.1-1). The Air Force also holds three safety easements associated with the base property: a 20-acre safety easement adjacent to the Small Arms Range, a 106-acre easement surrounding the Weapons Bunker, and a 287-acre easement surrounding the Belton Training Complex.

The Richards-Gebaur AFB region consists of rolling hills with elevations varying from 960 to 1,125 feet above mean sea level (MSL) (Figures 3.2-3a and b). The base is situated on the south-central portion of a broad plateau known as the Blue Ridge, with the Blue River to the west and the Little Blue River to the east providing drainage for the area. Both rivers flow northeast into the Missouri River, approximately 20 miles north of the base.

West-central Missouri exhibits a modified continental climate in which air currents from the Gulf of Mexico and other distant areas create rapid weather changes. Mean monthly temperatures range from 26 degrees Fahrenheit (°F) in January to 78° F in July. Annual precipitation in the area averages about 37 inches, falling mostly in the late spring and early summer and again in the early fall. Thunderstorms are common in the spring and summer and may be associated with high winds, heavy rainfall, hail, and tornados. Annual snowfall averages 20 inches, but has varied from as little as 4.5 inches to as much as 67.0 inches.

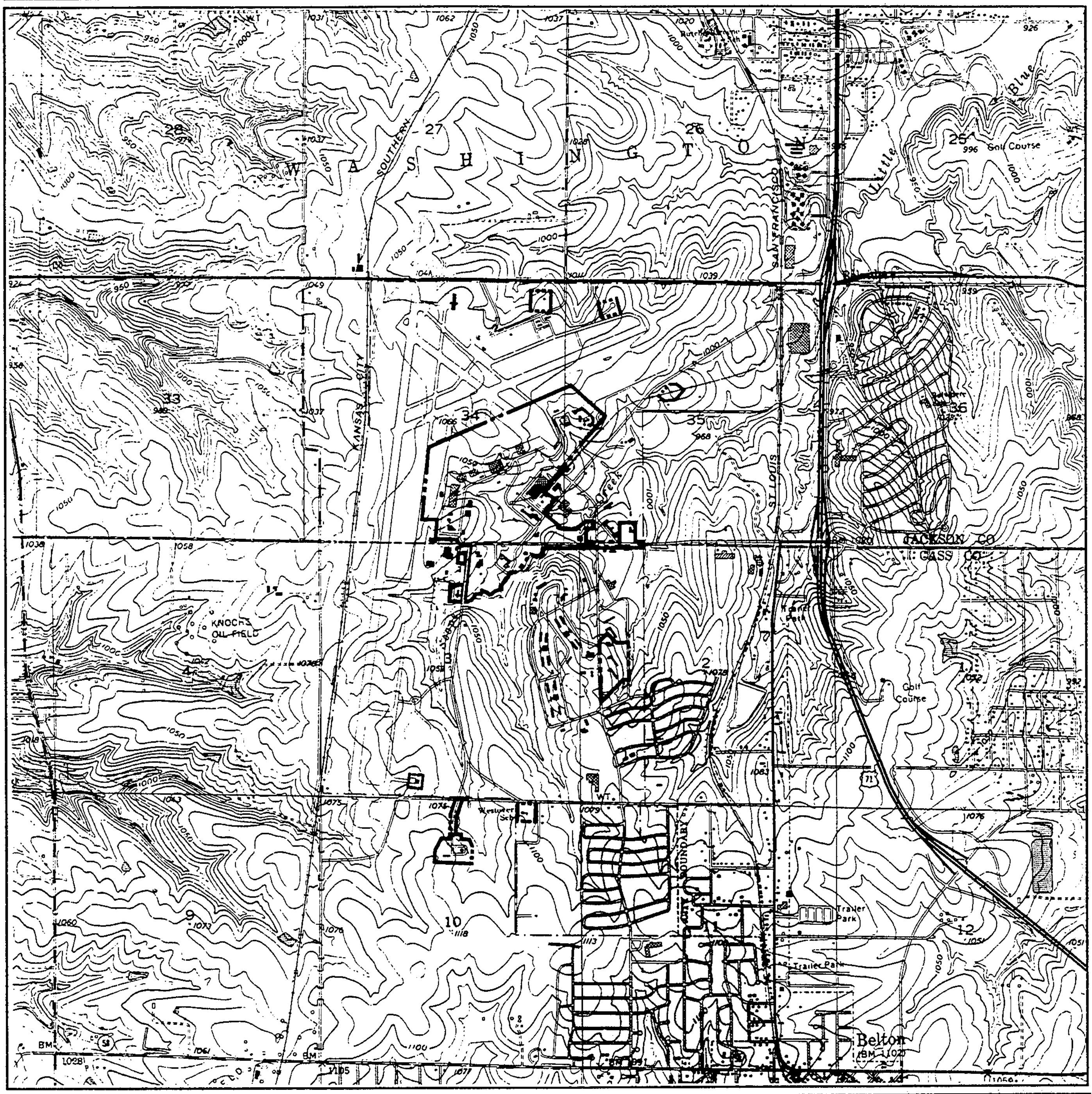
The two main access routes to the base are 155th Street and M-150. Immediately north of the base, M-150 runs east-west, providing access to the base via Andrews Road. In the central portion of the base, 155th Street enters from the east. U. S. Highway (US) 71, the major north-south highway in the vicinity, is approximately 1 mile east of the base boundary (Figure 3.2-4). Kansas City Southern Lines (KCSL) railroad provides rail service in the Richards-Gebaur AFB vicinity. A KCSL high-speed main line parallels the runway on the west, but does not service the base or the airport. A KCSL freight line east of the base runs approximately parallel to US 71. South of 155th Street, this line is owned by the Smokey Hill Railway and Historical Museum and is used for excursions only.

There are several airports in the Richards-Gebaur AFB region. The largest within approximately 20 miles of the base are Kansas City Downtown, Johnson County Executive, Johnson County Industrial, Lee's Summit, and Richards-Gebaur Airport. Richards-Gebaur Airport, owned by the city of Kansas City, currently operates as a joint use facility serving both civil and military aircraft. The closest commercial airport, Kansas City International (KCI), is approximately 35 miles north of the base (see Figure 3.2-1).



Government Jurisdictional Boundaries

Figure 3.2-2



EXPLANATION

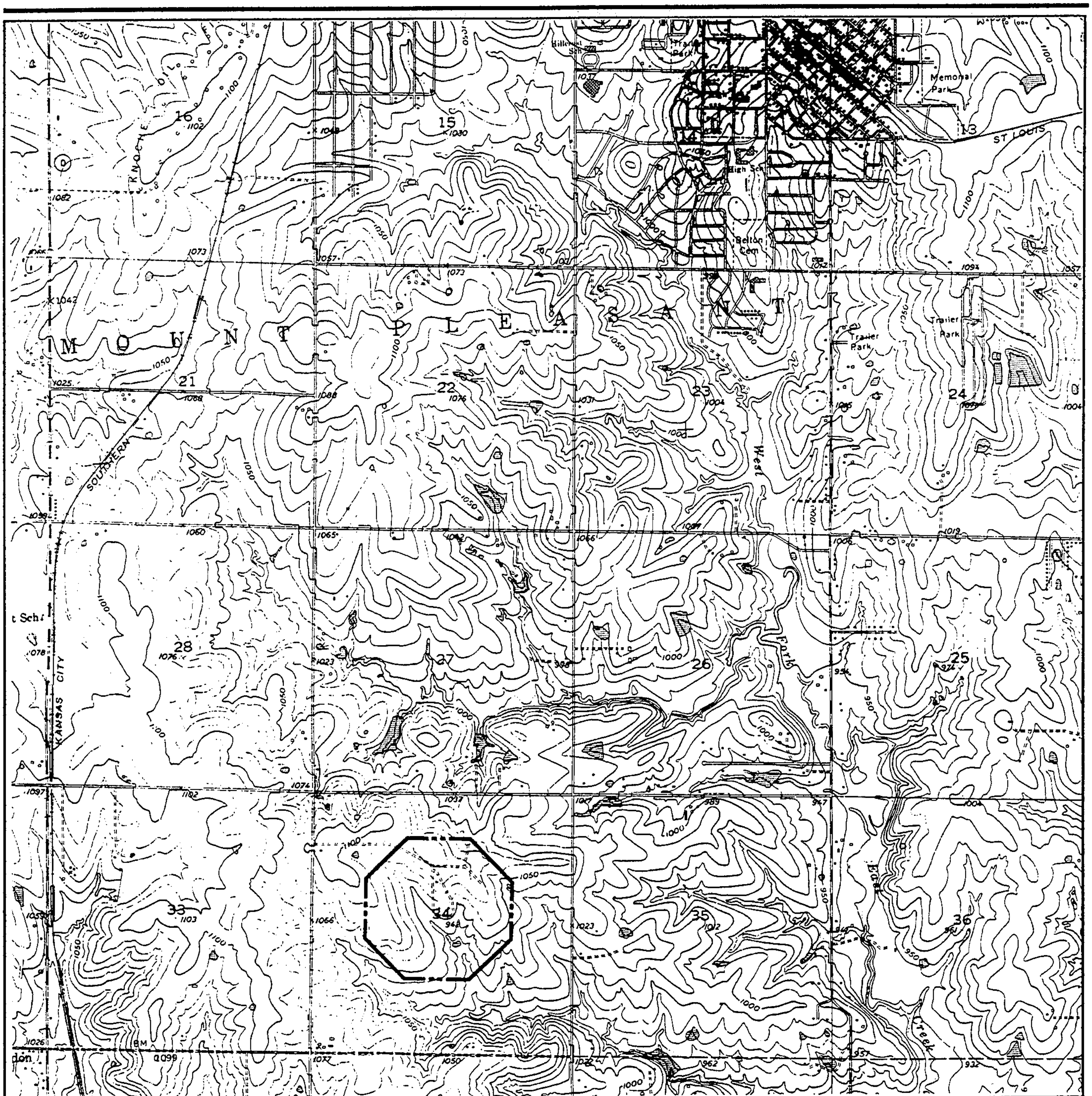
- - - - Base Boundary

Richards-Gebaur AFB and Vicinity

0 750 1500 3000 Feet

Map Source: U.S. Geological Survey, 1975.

Figure 3.2-3a



EXPLANATION

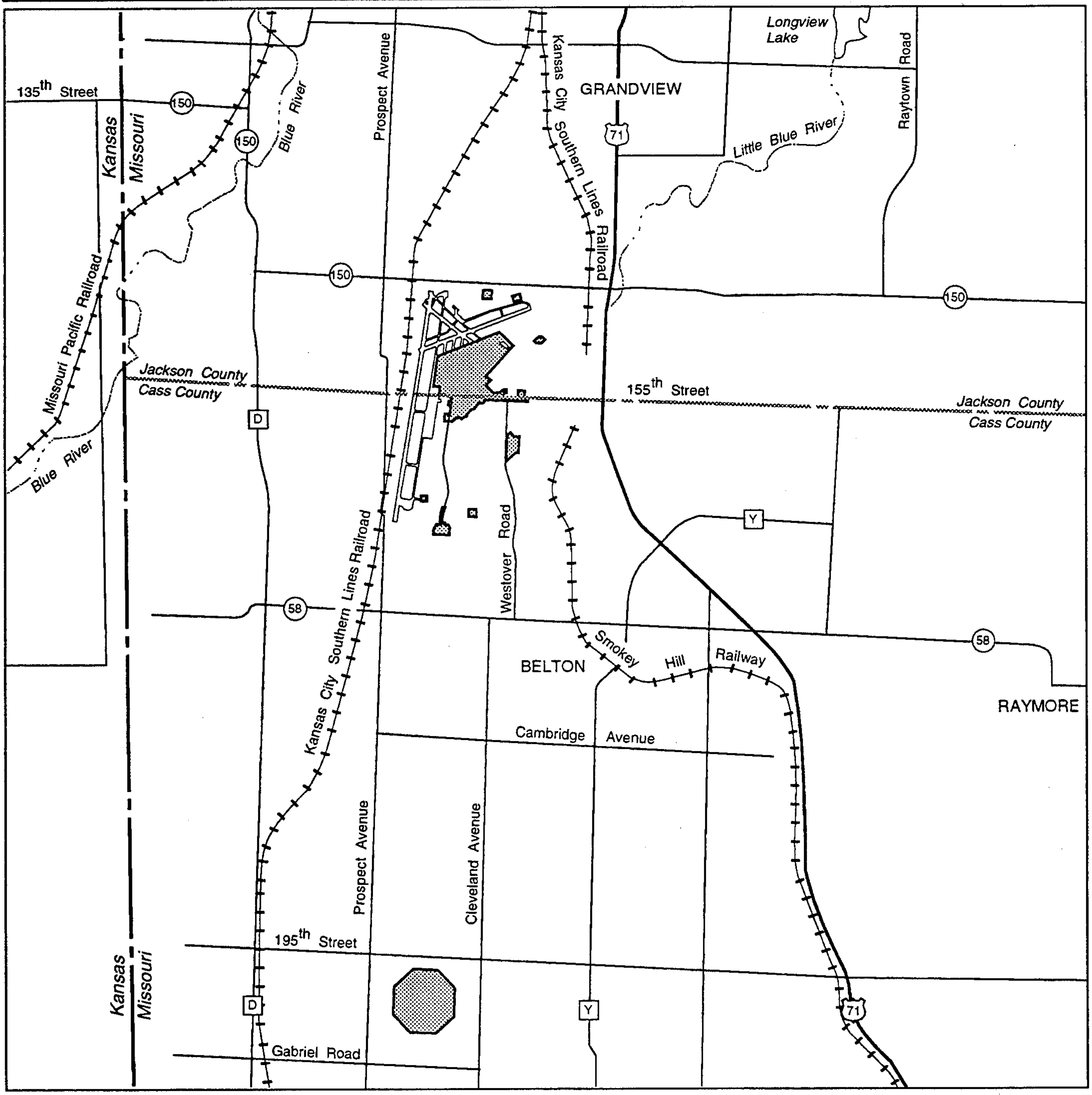
- - - - Base Boundary

Richards-Gebaur AFB and Vicinity

0 750 1500 3000 Feet

Map Source: U.S. Geological Survey, 1975, 1981.

Figure 3.2-3b



EXPLANATION

Base Property

U. S. Highway

State Highway

County Road

0 1750 3500 7000 Feet

Base Setting

Figure 3.2-4

Installation Background

The area now known as Richards-Gebaur AFB was initially acquired by Kansas City in 1941 as an auxiliary airport and was named Grandview Airport. In 1952, the Air Force leased Grandview Airport from Kansas City for headquarters of the Central Air Defense Command. By 1953, the property was formally conveyed to the U.S. government. Grandview AFB was redesignated Richards-Gebaur AFB in 1957 in honor of First Lieutenant John F. Richards II, who died in combat in World War I, and Lieutenant Colonel Arthur W. Gebaur, Jr., who was killed during the Korean War. Both pilots were natives of Kansas City.

Richards-Gebaur AFB remained an Air Defense Command base until 1970, when the Air Force Communications Command relocated its headquarters from Scott AFB, Illinois, to Richards-Gebaur AFB. In 1977, the Air Force Communications Command returned to Scott AFB, and the Military Airlift Command assumed control of the base. Between 1977 and 1979, the number of active duty military and civilian personnel at Richards-Gebaur AFB was drastically reduced, with the majority of the base operating support functions performed by civilian contractors. In October 1980, when the Air Force Reserve assumed operational control of the base, an interim lease and joint use of the airport with the KCAD became effective. In August 1985, 1,360 acres of Richards-Gebaur AFB were conveyed to Kansas City. Since that time, the U.S. Air Force Reserve has operated at the Richards-Gebaur Airport under a joint use agreement with Kansas City.

The 442nd Troop Carrier Wing was first assigned to Richards-Gebaur AFB in 1955, and has remained through several redesignations and changes of major command. The unit was last designated the 442nd Fighter Wing (FW) in 1984, and this Air Force Reserve unit is the host unit at Richards-Gebaur AFB. The mission of the 442nd FW is to train personnel in order to sustain a combat-ready posture capable of worldwide deployment. Since 1982, the unit has operated A-10 Thunderbolt II aircraft, the first Air Force aircraft designed specifically for close air support of ground forces.

3.2.1 Community Setting

Richards-Gebaur AFB is in the southeastern portion of the Kansas City Metropolitan Statistical Area (MSA). The MSA encompasses ten counties in the states of Missouri and Kansas, and had a 1990 population of approximately 1.6 million. The base property is within the jurisdictions of Kansas City, Belton, and Cass County (see Figure 3.2-2). The ROI for employment and population effects from disposal and reuse of the base consists of Cass and Jackson counties in Missouri. The greatest effects of reuse are expected to occur in the communities of Belton, Harrisonville, Raymore, and Peculiar in Cass County; Grandview and Lee's Summit in

Jackson County; and Kansas City in Jackson and Cass counties (see Figure 3.2-1).

Employment in the two-county ROI was 462,078 in 1990, and is projected to be 482,927 at the time of base closure in 1994. Overall employment in the ROI grew at an average annual rate of 0.7 percent between 1970 and 1990. The major employment sectors in the ROI are services; retail trade; manufacturing; finance, insurance, and real estate; and state and local government. In 1992, Richards-Gebaur AFB employed 632 active duty military and civilian personnel. By closure, employment will have declined to six direct and five secondary jobs associated with the OL.

The combined population of Jackson and Cass counties in 1990 was 697,040, and is expected to be 705,923 at closure in 1994. From 1970 to 1980, population in the ROI declined by 0.2 percent annually, but increased by the same percentage from 1980 to 1990. Most of the growth was in Cass County.

3.2.2 Land Use and Aesthetics

This section describes the land uses and aesthetics for the base property and the surrounding areas of Richards-Gebaur AFB at base closure. Projected land uses at closure are assumed to be similar to existing land uses in the vicinity of the base.

Richards-Gebaur AFB property is owned by the U.S. government, is operated by the Air Force Reserve, and falls within the jurisdiction of three separate bodies of government (see Figure 3.2-2). The Cantonment Area, the Air Traffic Transceiver, the Fire Training Area, the Small Arms Range, the Billeting Complex, and the NDI Laboratory all lie within the jurisdiction of Kansas City. The Mobile Radio Transceiver and the Weapons Bunker lie within the city of Belton, and the Belton Training Complex is within an unincorporated area of Cass County. The ROI for land use thus includes those three jurisdictions.

3.2.2.1 Land Use

Land Use Plans and Regulations. The comprehensive plan for a jurisdiction represents the official position on long-range development and resource management. The position is expressed in goals, policies, plans, and actions regarding the physical, social, and economic environments, both now and in the long term.

The Masterplan for Development of Non-Aviation Property at Richards-Gebaur Airport and the Martin City Area Land Use Plan (Peckham Guyton Albers and Viets, Inc., 1987, 1988) cover the base property within Kansas City's jurisdiction. The Masterplan includes the Small Arms Range, the

Billeting Complex, and a small portion of the Cantonment, along with former base property. The Masterplan recommends retail, office-warehouse, and open space land uses in these areas. The Martin City Plan includes the Cantonment Area, the Air Traffic Transceiver, the Fire Training Area, and the Small Arms Range within its study area. The plan recommends business services and light industrial land uses for the areas to the north and west of Richards-Gebaur AFB. The KCAD is preparing an updated plan for the present and former base property.

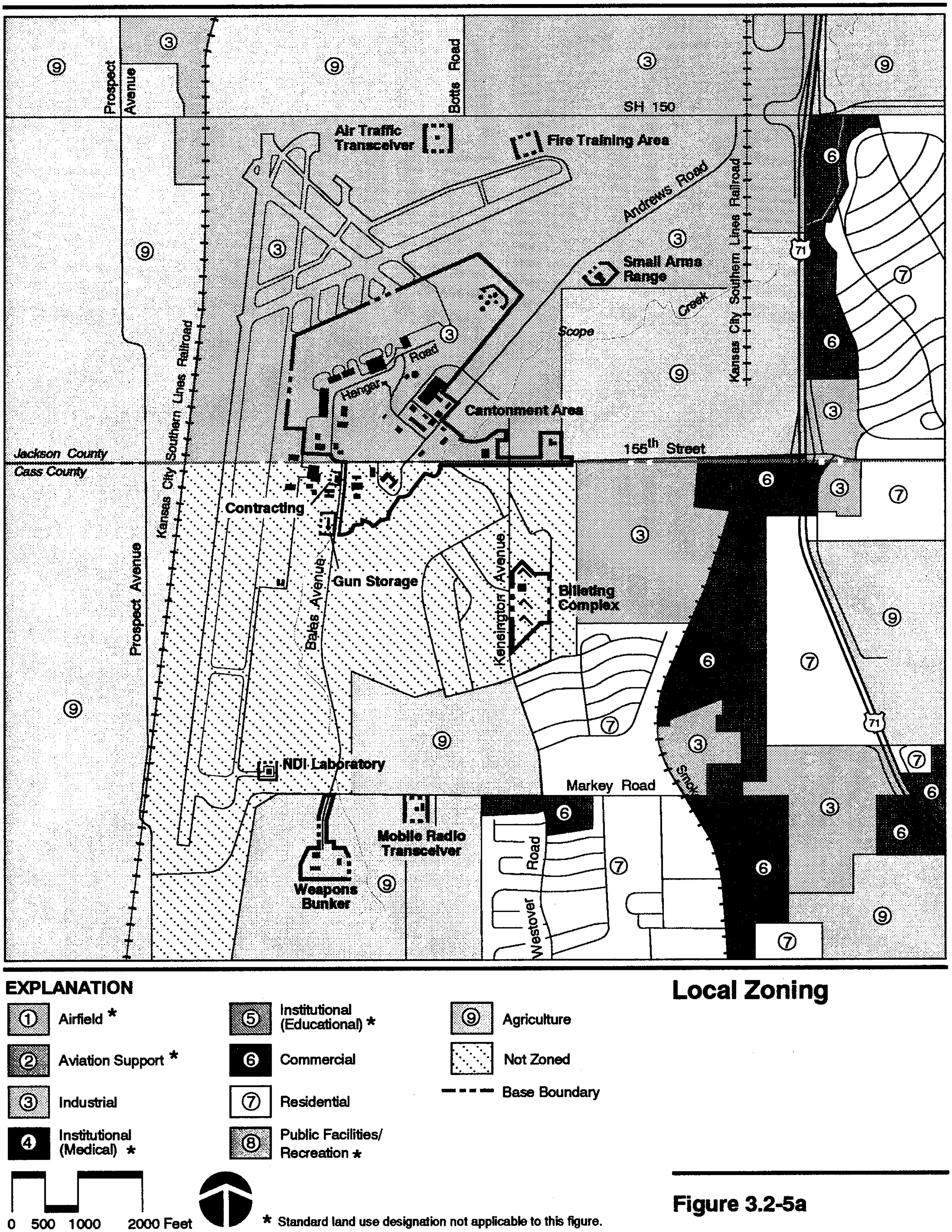
Belton's Comprehensive Plan (City of Belton, 1992b) proposes industrial, commercial, public facilities/recreation, and residential land uses for the area east of the Cantonment Area and low-density residential uses west of the airfield. Proposed long-range industrial and office land uses have been identified for the Weapons Bunker and Mobile Radio Transceiver, within Belton's jurisdiction.

Cass County details its land use plans in the Comprehensive Plan, Zoning Ordinance, Subdivision Regulations, and Procedural Manual adopted in 1991. The Comprehensive Plan encourages the concentration of urban land uses, restricting development to areas with few environmental hazards, and minimizing the loss of natural resources due to urbanization.

Zoning. Zoning provides for the division of the jurisdiction, in conformity with the comprehensive plan, into districts within which the height, open space, building coverage, density, and type of future land uses are set forth. Zoning is designated to achieve various community development goals, including helping to implement comprehensive plans.

The Kansas City Zoning Ordinance (City of Kansas City, 1988b) designates the portion of the Cantonment Area north of 155th Street, and the surrounding property, for industrial land uses with a provision for inclusion of commercial uses (Figure 3.2-5a). The Air Traffic Transceiver, Fire Training Area, and Small Arms Range are also within this area zoned for industrial land uses. The area north of M-150 is zoned for industrial and agricultural uses. The area north of 155th Street and east of the Cantonment Area is zoned for agricultural land uses. The portion of the Cantonment Area south of 155th Street and the Billeting Complex, Contracting, Gun Storage, and NDI Laboratory parcels have not been zoned.

Belton's Zoning Ordinance (City of Belton, n.d.) denotes the area to the southeast of the Cantonment Area for industrial, commercial, and residential land uses. The Mobile Radio Transceiver and Weapons Bunker are zoned for agricultural land use. This zoning designation provides for crop and livestock production, forestry, and public recreational and low-density residential (i.e., a maximum density of one dwelling unit per 5 acres) uses.



Local Zoning

Figure 3.2-5a

The Cass County Zoning Ordinance (Cass County, 1991c) has zoned the region southwest of the Cantonment Area within their jurisdiction as agricultural. This zoning provides for crop production, forestry, and low-density residential (i.e., a maximum density of one dwelling unit per 20 acres) uses. The Belton Training Complex is zoned for agricultural land uses and the surrounding land is zoned for agricultural and residential uses (Figure 3.2-5b).

On-Base Land Use. The base property includes the following existing land uses and acreages:

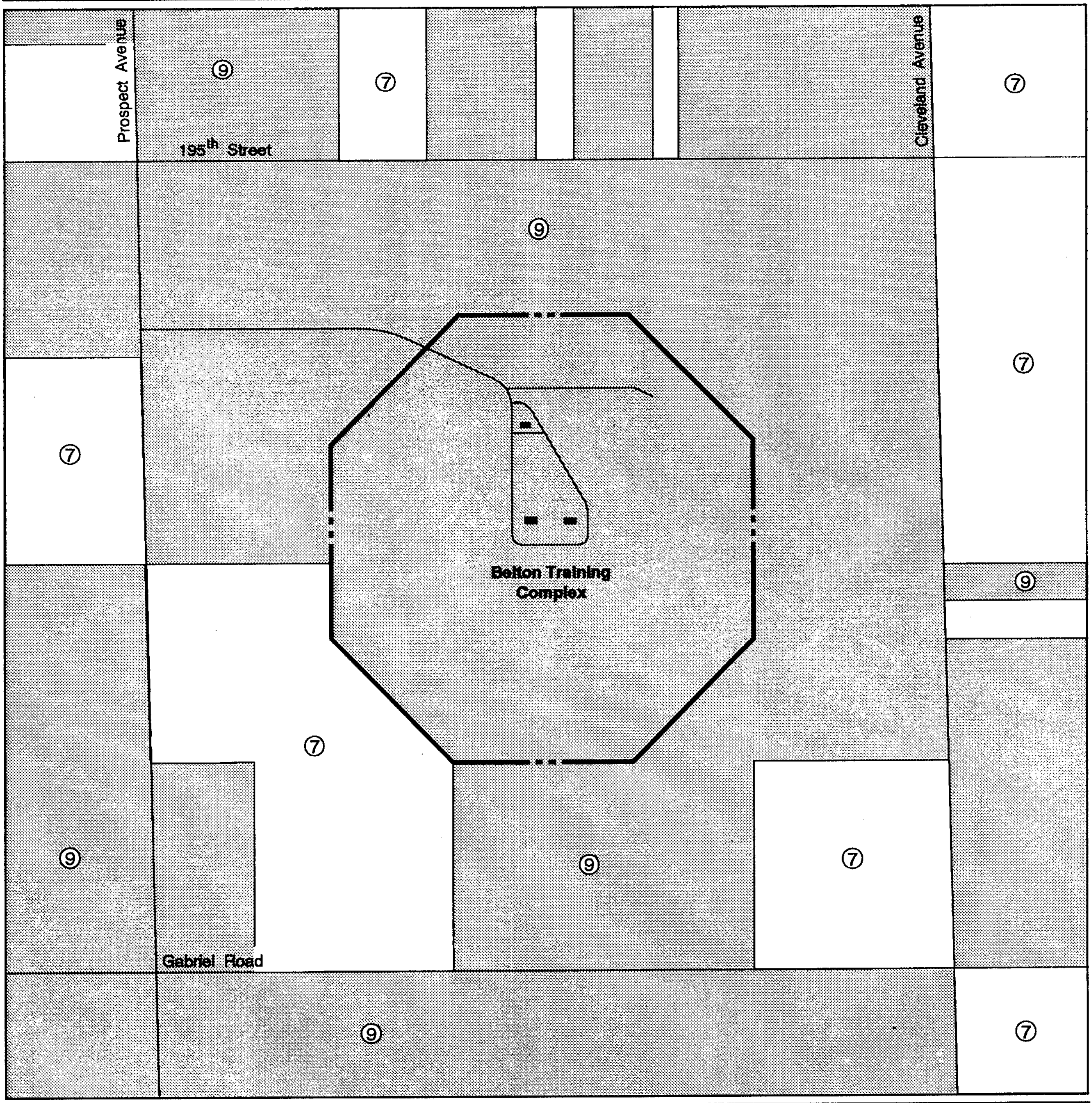
Land Use	Acreage
Aviation Support	85
Industrial	45
Institutional (Medical)	6
Institutional (Educational)	184
Commercial	26
Residential	9
Public Facilities/Recreation	19
Vacant Land	52
Total	426

The existing land uses at Richards-Gebaur AFB are shown on Figure 3.2-6 and described briefly below.

The **aviation support** land use areas contain the aircraft parking apron, the control tower, fire station, hangars, and other related facilities. These facilities are on the north and west sides of the Cantonment Area, bordering the Richards-Gebaur Airport. The Air Traffic Transceiver and Mobile Radio Transceiver parcels contain navigation and communication equipment, and are also identified as aviation support land use areas.

Industrial areas in the Cantonment Area include the base supply warehouse, civil engineering complex, fuel storage/management, and vehicle maintenance areas. The Fire Training Area, Small Arms Range, Gun Storage, NDI Laboratory, and Weapons Bunker parcels are all considered industrial land use areas. The Fire Training Area is not in use.

Institutional land uses are separated into two categories: medical and educational. The institutional medical land use areas contain the medical and dental clinics in four separate buildings located in the Cantonment Area. The Dental Clinic building is vacant. The only institutional educational land use area is the Belton Training Complex, which is leased by the Army Reserve and is used for training activities.



EXPLANATION

① Airfield *

② Aviation Support *

③ Industrial *

④ Institutional (Medical) *

⑤ Institutional (Educational) *

⑥ Commercial *

⑦ Residential

⑧ Public Facilities/ Recreation *

⑨ Agriculture

Base Boundary

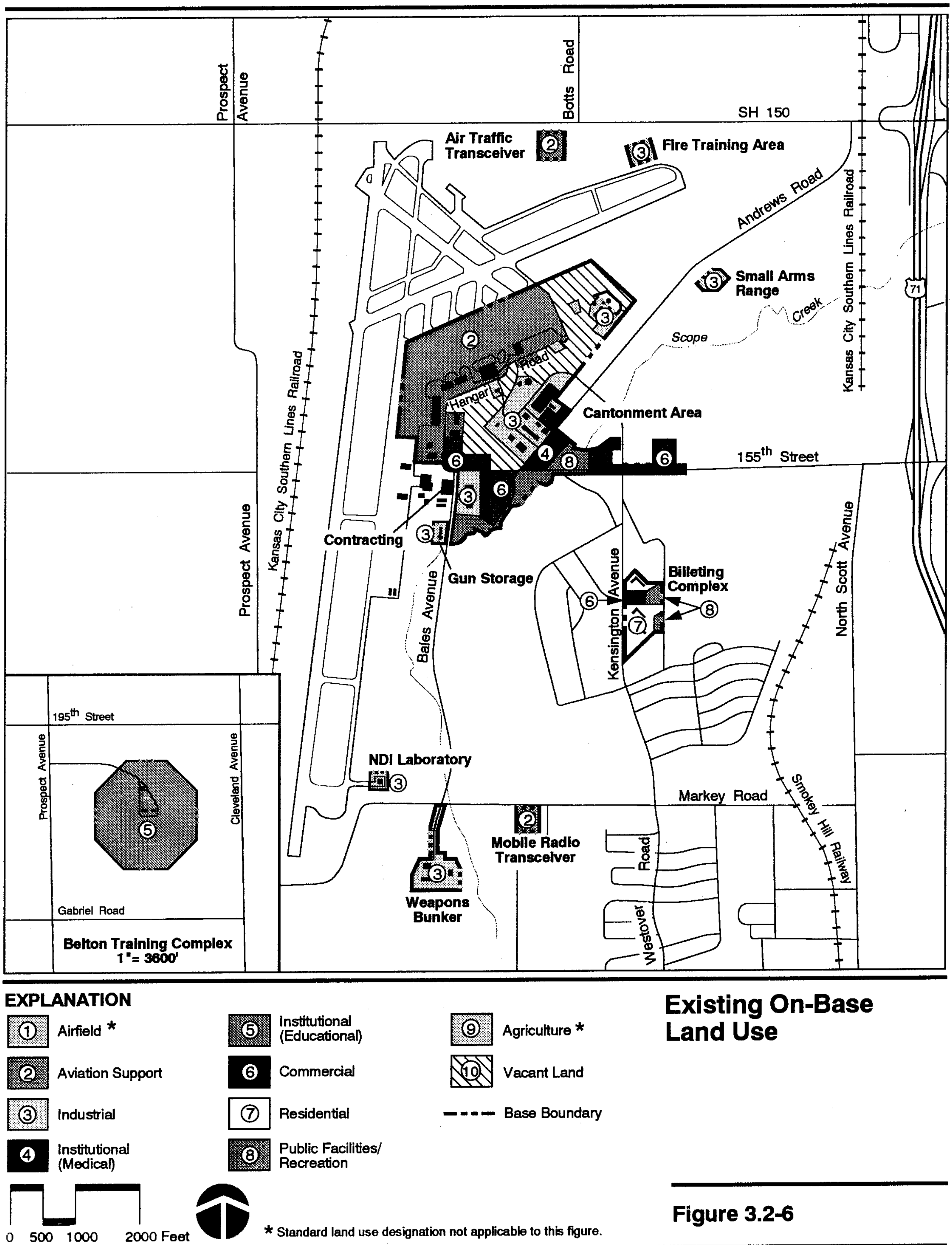
0 250 500 1000 Feet

Source: Cass County, 1991c.

* Standard land use designation not applicable to this figure.

Local Zoning

Figure 3.2-5b



Existing On-Base Land Use

Figure 3.2-6

The **commercial** land use areas in the Cantonment Area contain the Base Exchange, post office, and administrative buildings. The Contracting parcel and the dining facility at the Billeting Complex are also commercial use areas.

The **residential** area is within the Billeting Complex. It contains three dormitories, which can accommodate approximately 244 personnel.

Public facilities/recreation land use areas comprise the tennis courts and swimming pool located at the Billeting Complex, as well as a park in the Cantonment Area adjacent to Scope Creek. The park contains a picnic shelter and restrooms.

The **vacant land** in the Cantonment Area consists of the undeveloped area between the aviation support and the industrial land uses. This area encompasses natural surface drainage channels that carry runoff to Scope Creek from the airfield, aircraft parking apron, and the aviation support facilities.

Leases and Easements. The Air Force typically grants a number of leases, easements, and licenses to other agencies and private individuals for use of the base property. At Richards-Gebaur AFB, the 184-acre Belton Training Complex is used by the Army Reserve for training activities under a permit from the Air Force. There are also a number of right-of-way easements for use by Kansas City Power and Light Company, Missouri Public Service Company, and Southwestern Bell Telephone Company, in addition to the use of 155th Street within base property by non-base personnel (Table 3.2-1).

Various easements and restrictions are in effect surrounding specific land use areas for safety purposes and to accommodate navigational aids and tactical areas. Three major safety easements associated with the base: 20 acres adjacent to the Small Arms Range, 106 acres surrounding the Weapons Bunker, and 287 acres surrounding the Belton Training Complex. There are no avigation easements at Richards-Gebaur AFB. Generally, these easements will be terminated when there is no longer a military need for the areas.

Adjacent Land Use. Richards-Gebaur Airport, which includes airfield and aviation support land uses, is north and west of the Cantonment Area (Figure 3.2-7a). Because of FAA airport regulations, building and noise restrictions affect land uses in the Cantonment Area adjacent to the airfield. A Building Restriction Line (BRL) limits the allowable height of buildings within a specified distance of the centerline of both runways. The BRL restricts development of buildings more than 40 feet tall, the standard

Table 3.2-1. Inventory of Easement Agreements, Licenses, Permits, and Leases

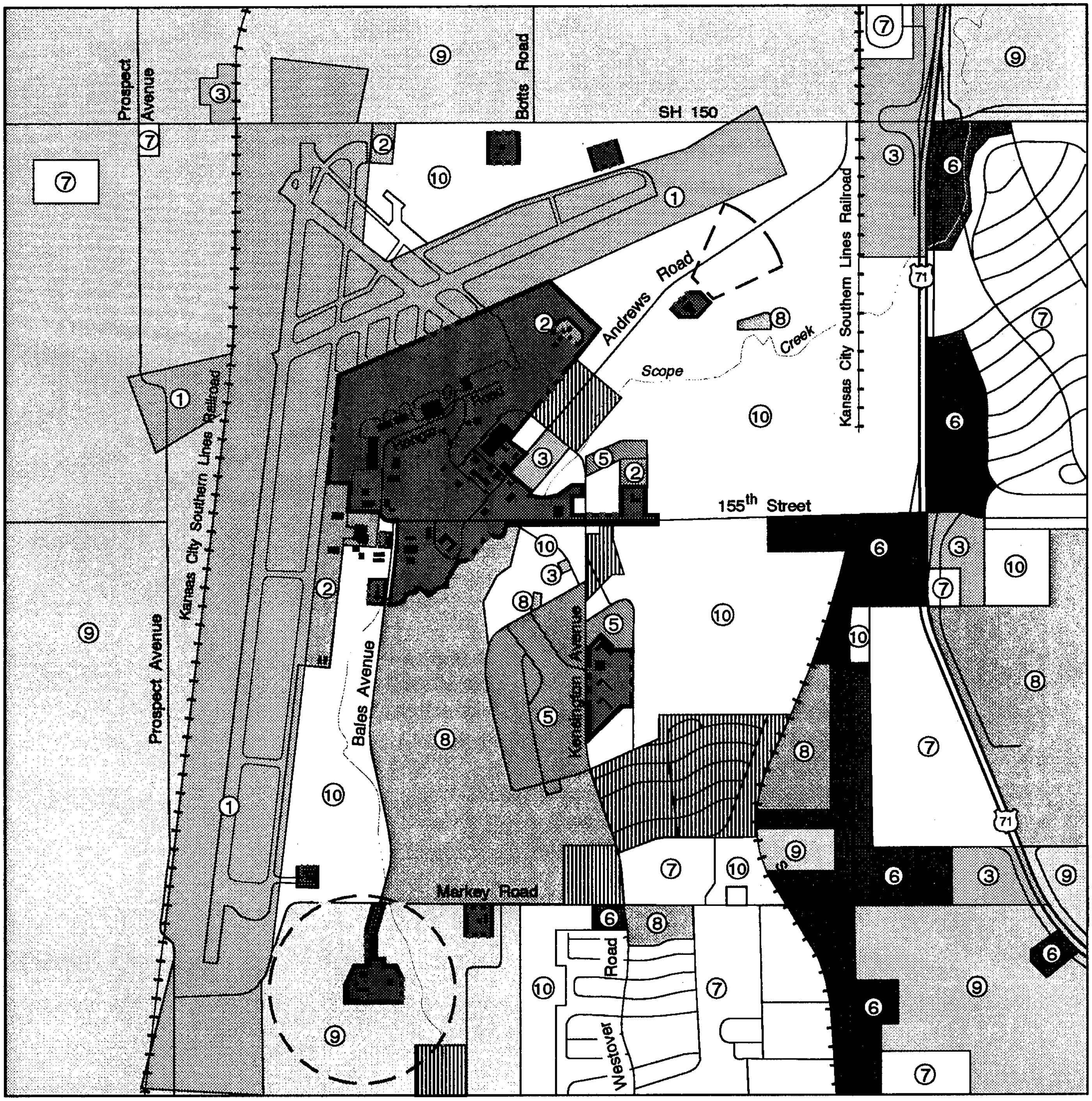
Document Number	Expiration Date	Description/Location	Responsible Party
DACA41-89-500	10/20/1994	Permit to conduct training at Training Annex, 4 miles south of base	Army Reserve
DACA41-2-92-507	11/28/2016	Right-of-Way easement for 155th Street	Kansas City, Missouri
DACA41-2-88-580	3/12/2014	Gas Pipeline Right-of-Way easement	Kansas City Power & Light
DACA41-2-90-522	4/19/2015	Gas Pipeline Right-of-Way easement	Kansas City Power & Light
DACA41-2-92-572	10/31/1996	Gas Pipeline Right-of-Way easement	Kansas City Power & Light
DACA41-2-92-502	10/31/2016	Gas Pipeline Right-of-Way easement	Kansas City Power & Light
DACA41-2-86-556	4/15/2011	Construction Right-of-Way easement	Missouri Public Service Company
DACA41-2-88-550	9/7/1993	Right-of-Way easement	Southwestern Bell Telephone

Source: Richards-Gebaur AFB, 1992.

hangar height, within 780 feet of the Runway 18/36 centerline and within 530 feet of the Runway 06/24 centerline.

The area north of the airport is agricultural, but includes vacant areas surrounding the Air Traffic Transceiver and Fire Training Area parcels. The area west of the airfield is characterized by agricultural land uses, including nursery stock production. South of the Cantonment Area are an industrial area associated with the former base heating plant; an institutional (educational) area containing the Calvary Bible College, on Kensington Avenue; and public facilities/recreational areas consisting of a golf course and a church. An agricultural area is at the southeastern end of the airfield, surrounding the Weapons Bunker and Mobile Radio Transceiver, and vacant land is present east of the airfield. The area south of Markey Road is primarily residential, with adjacent commercial, public facilities/recreation, and vacant land uses.

The area east of the Cantonment Area is mostly vacant land within which are small commercial, residential, and public facilities/recreation areas. Four parcels owned by other DOD agencies are southeast of the Cantonment Area. The Marine Corps owns a small parcel north of the Billeting Complex, which is used for office space, and a family housing area southeast of the Billeting Complex. The Army Reserve owns a parcel southwest of the Billeting Complex that is used for various administrative functions. The



EXPLANATION

1	Airfield
2	Aviation Support
3	Industrial
4	Institutional (Medical) *
5	Institutional (Educational)
6	Commercial
7	Residential
8	Public Facilities/ Recreation
9	Agriculture
10	Vacant Land
	Base Property
	Other Military Property
	Base Boundary
	Easement

0 500 1000 2000 Feet

* Standard land use designation not applicable to this figure.

Off-Base Land Use

Figure 3.2-7a

Navy owns a parcel southeast of the Weapons Bunker, where the SeaBees conduct training and administrative functions.

The area surrounding the Belton Training Complex is predominantly agricultural, with scattered low-density residential land uses and a single commercial entity to the northeast (Figure 3.2-7b).

Closure Baseline. In September 1994 the installation will be closed and the military activities on base will be terminated. The OL will continue to coordinate the disposal activities of the base property, serve as the U.S. Air Force liaison supporting community reuse, and establish a caretaker force to assure resource protection, grounds maintenance, utility operations, and building care for base facilities.

3.2.2.2 Aesthetics. Visual resources include natural and man-made features that give a particular environment its aesthetic qualities. Criteria used in the analysis of these resources include visual sensitivity, which is the degree of public interest in a visual resource and concern over adverse changes in its quality. Visual sensitivity is categorized in terms of high, medium, or low levels.

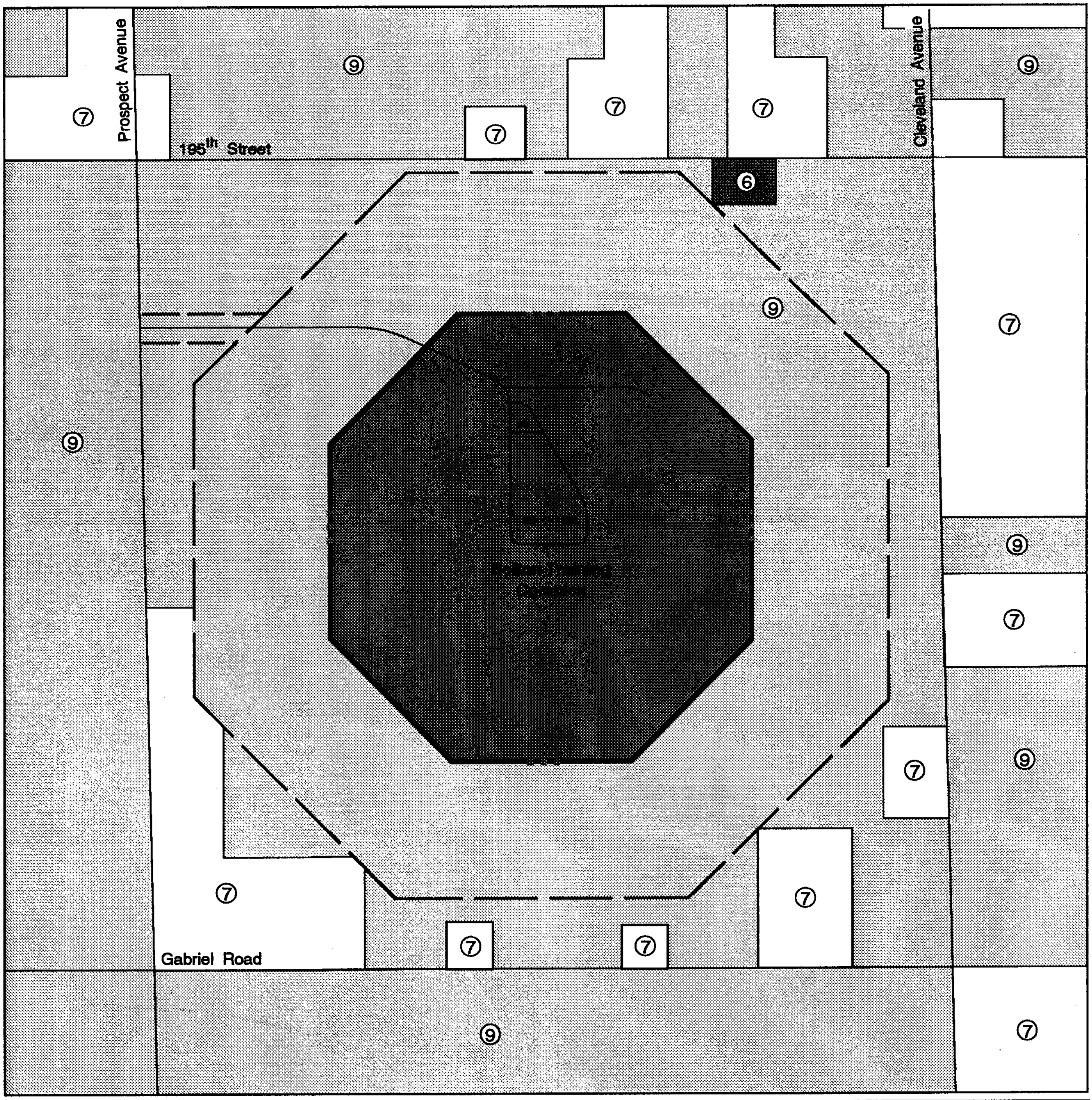
High visual sensitivity exists in areas where views are rare, unique, or in other ways special, such as in remote or pristine environments. High-sensitivity views would include landscapes that have landforms, vegetative patterns, water bodies, or rock formations of unusual or outstanding quality.

Medium visual sensitivity areas are more developed than those of high sensitivity, and the presence of motorized vehicles and other evidence of modern civilization is commonplace. These landscapes generally have features containing varieties in form, line, color, and texture, but tend to be more common than high visual sensitivity areas. Low visual sensitivity areas tend to have minimal landscape features, with little change in form, line, color, and texture.

Richards-Gebaur AFB is located in the Missouri River Basin. A series of bluffs follow along the eastern side of the Blue River situated to the northwest and west of the Cantonment Area. The area is characterized by rolling hills incised by natural drainages. Vegetation in the area is mainly prairie grasslands interspersed with wooded areas, primarily along the rivers.

The present appearance of the base includes a variety of building styles. Most of the buildings are a single story, of wood construction, and were built in the 1950s and 1960s. Many have been renovated in the past 10 years.

On base, areas of high visual sensitivity are present in the Cantonment Area along Scope Creek and along two wooded drainages in the Belton Training



EXPLANATION

①	Airfield *
②	Aviation Support *
③	Industrial *
④	Institutional (Medical) *
⑤	Institutional (Educational) *
⑥	Commercial
⑦	Residential
⑧	Public Facilities/ Recreation *
⑨	Agriculture
⑩	Vacant Land *
	Base Property
	Other Military Property *
- - - -	Base Boundary
— —	Easement

0 250 500 1000 Feet

* Standard land use designation not applicable to this figure.

Off-Base Land Use

Figure 3.2-7b

Complex (Figure 3.2-8). There are no high visual sensitivity areas on the other parcels. High visual sensitivity areas off base include the former base golf course and wooded drainages.

3.2.3 Transportation

Transportation addresses the roadways, airspace and air transportation, and railroads. The ROI for the transportation analysis includes the existing principal road, air, and rail networks in the local communities of Kansas City, Grandview, and Belton, with emphasis on the immediate area surrounding Richards-Gebaur AFB. Within this geographic area, the analysis focuses on the segments of the transportation networks that serve as key linkages to the base.

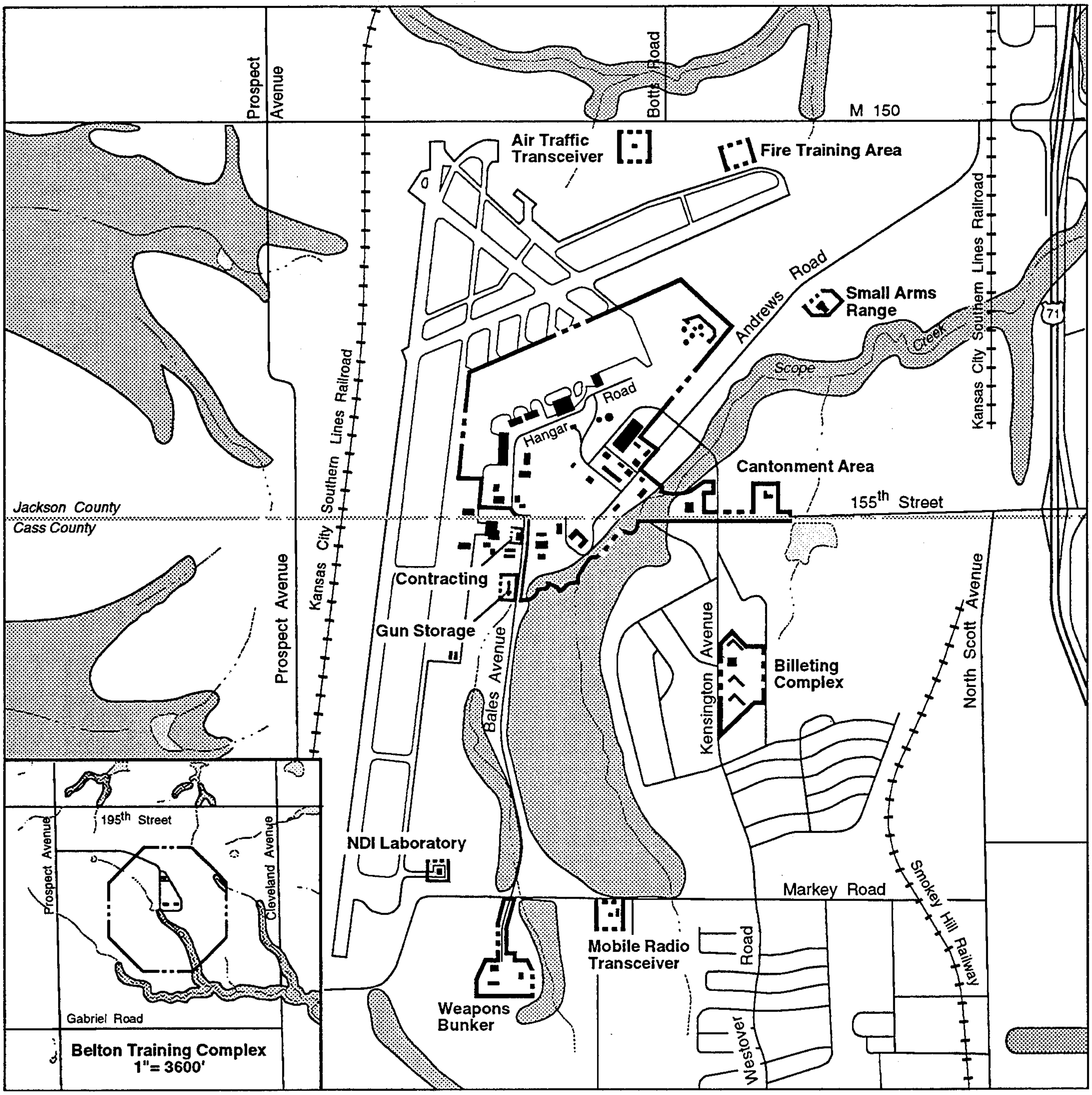
3.2.3.1 Roadways. The evaluation of the existing roadway conditions focuses on the concept of capacity, which reflects the ability of a roadway to serve traffic demand and volume. Roadway capacity is a function of several factors including the number of lanes, lane and shoulder width, traffic control devices (e.g., traffic signals), and percent truck traffic.

Traffic volumes typically are reported as the total daily traffic moving in both directions of the highway. These daily volumes may be distinguished as: (1) average annual daily traffic (AADT), the total two-way volume on a segment in a year divided by the number of days in the year; (2) average daily traffic (ADT), the total two-way traffic for a number of days less than a year divided by the number of days; and (3) peak hour volume, the amount of traffic that occurs in the typical peak hour of the day. ADT estimates are used in this report because no continuous count data are available for the road segments in the ROI.

For comparison to calculated roadway capacities, ADTs are converted to peak-hour volume. The comparison of peak-hour volume to capacity is expressed in terms of level of service (LOS). The LOS scale ranges from A to F, with each level defined by a range of volume-to-capacity ratios, which is the peak-hour volume divided by the capacity. LOS A, B, and C are considered good operating conditions in which minor or tolerable delays are experienced by motorists. LOS D and E represent acceptable, but below average conditions. LOS F represents an unacceptable situation of unstable stop-and-go traffic. Table 3.2-2 summarizes the LOS designations and their representative volume-to-capacity ratios.

Existing roads and highways within the ROI are described at two levels: regional, representing the major links within the Kansas City area, and local, representing community roads.

Regional. Kansas City is served by a "beltway" (Interstate [I-]435) (see Figure 3.2-1), which encircles the city, and several other interstate links that



EXPLANATION

High Visual Sensitivity

Base Boundary

High Visual Sensitivity

0 500 1000 2000 Feet

Figure 3.2-8

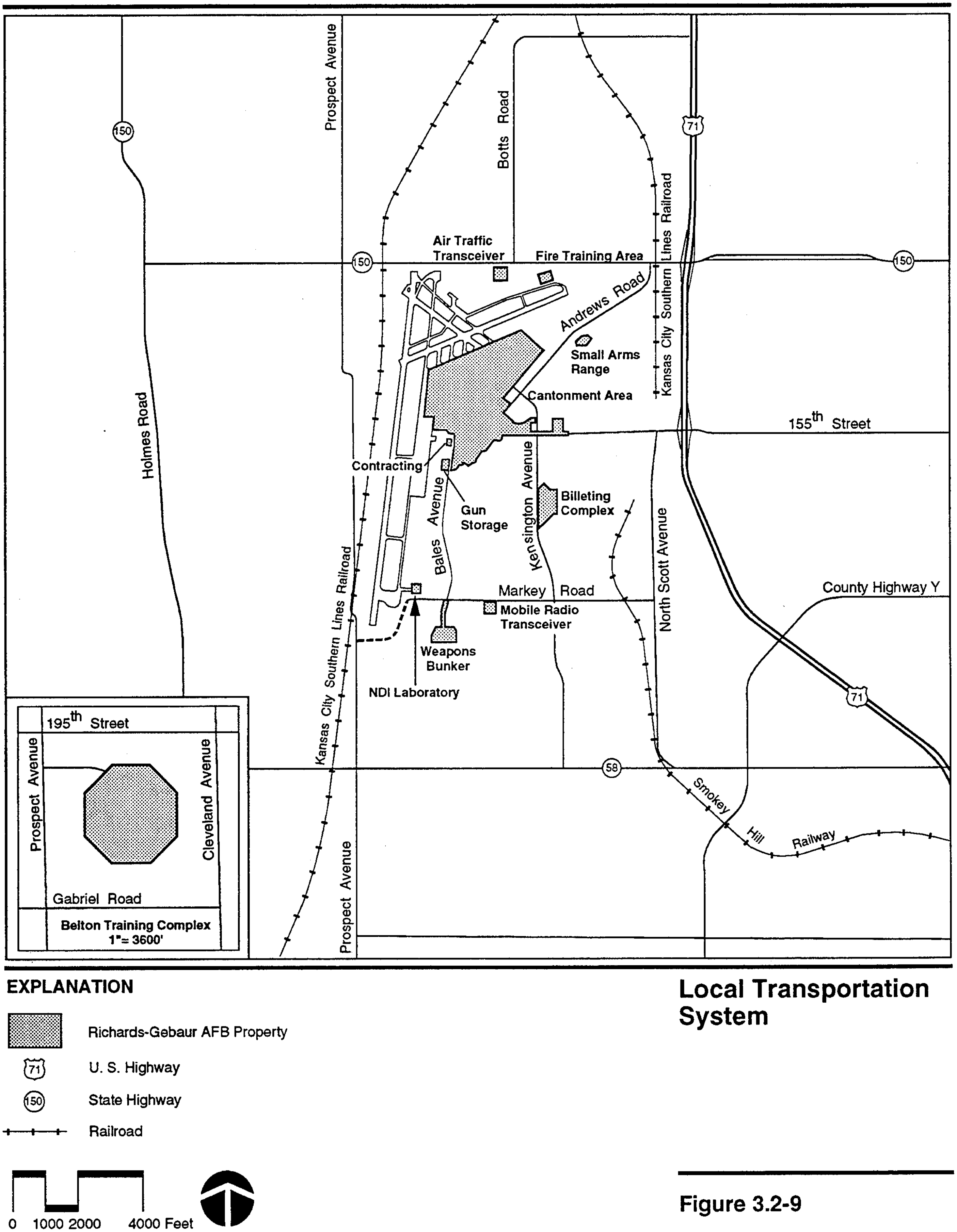
Table 3.2-2. Road Transportation Levels of Service

LOS	Description	Criteria (Volume/Capacity) Freeway[a]	4-Lane[b] Arterial	2-Lane[c] Highway
A	Free flow with users unaffected by presence of other users of roadway	0-0.35	0-0.28	0-0.10
B	Stable flow, but presence of the users in traffic stream becomes noticeable	0.36-0.54	0.29-0.45	0.11-0.23
C	Stable flow, but operation of single users becomes affected by interactions with others in traffic stream	0.55-0.77	0.46-0.60	0.24-0.39
D	High density, but stable flow; speed and freedom of movement are severely restricted; poor level of comfort and convenience	0.78-0.93	0.61-0.76	0.40-0.57
E	Unstable flow; operating conditions at capacity with reduced speeds, maneuvering difficulty, and extremely poor levels of comfort and convenience	0.94-1.00	0.77-1.00	0.58-0.94
F	Forced or breakdown flow with traffic demand exceeding capacity; unstable stop-and-go traffic	>1.00	>1.00	>0.94

Notes: (a) Table 3-1, Levels of Service for Basic Freeway Section, Highway Capacity Manual, Transportation Research Board, 1985.
(b) Table 7-1, Levels of Service Criteria for Multilane Highways, 4-lane arterial, 50 mph Design Speed, Highway Capacity Manual, Transportation Research Board, 1985.
(c) Table 8-1, Level of Service Criteria for General 2-lane Highway Segments, Rolling Terrain, 20 percent no passing zones, Highway Capacity Manual, Transportation Research Board, 1985.
LOS = level of service.

provide connection both within the I-435 perimeter and outside. I-435 and I-470 are the major interstate highways in the Richards-Gebaur AFB area and are less than 10 miles north of the base. These highways provide the base with access to downtown Kansas City and other regional destinations. US 71 is the major north-south highway serving the ROI (Figure 3.2-9); it connects the base with the interstate complex. Within the ROI, US 71 is constructed to freeway standards, i.e., four lanes, divided, with access control. Two state highways serve as east-west arterials within the ROI (see Figure 3.2-9). M-150, just north of Richards-Gebaur AFB and Airport, provides access into adjacent Kansas. M-58, south of the base, runs through the city of Belton.

Local. Key local roads discussed in this analysis are depicted on Figure 3.2-9. The primary access to Richards-Gebaur AFB is 155th Street, an east-west arterial that connects US 71 to the base. Access from the north is via Prospect Avenue or Botts Road to M-150 (147th Street). Prospect Avenue runs north-south on the west side of the airfield and provides access to the Belton Training Complex in Cass County. Botts Road connects to M-150 between Prospect Avenue and US 71 and provides access to an industrial area in Grandview. The Cantonment Area is accessed from the north by Andrews Road, which connects with M-150. Access from the south is provided by Kensington Avenue/Westover Road



Local Transportation System

Figure 3.2-9

and North Scott Avenue, which connect to 155th Street and M-58. Kensington Avenue provides access from the Cantonment Area to the Billeting Complex, and Westover Road provides access to the Mobile Radio Transceiver and Weapons Bunker by way of Markey Road. Markey Road, an east-west street, connects North Scott Avenue with Westover Road south of the Cantonment Area.

Roadway Improvements. Several roadway improvement projects are planned in the ROI. Projects planned in the next 5 to 7 years (MARC, 1992b) include widening the following segments from two to four lanes: M-150 between Holmes Road and US 71, M-58 between North Scott Avenue and Highway Y, and North Scott Avenue between 155th Street and M-58. Andrews Road just south of M-150 will be realigned. In addition, a new four-lane roadway is planned to extend Markey Road east from North Scott Avenue to US 71. Over the 7- to 20-year time frame (MARC, 1990b), it is planned to widen US 71 from four to six lanes between 155th Street and M-58.

Preclosure Reference. Capacity analyses were conducted for the key local roadways; results are shown in Table 3.2-3. M-58 between US 71 and North Scott Avenue and 155th Street at the US 71 interchange operate at LOS F during the peak hour. M-150 between Holmes Road and US 71 and North Scott Avenue from M-58 to Markey Road operate at LOS E. Widening from two to four lanes, planned for the M-150 and North Scott Avenue segments, would relieve congestion on those segments. All other segments in the ROI operate at LOS D or better during the peak hour.

Table 3.2-3. Peak-Hour Traffic Volumes on Local Roads

			Preclosure (1992)		Closure (1994)	
Roadway	Segment	Capacity	Peak-Hour Volume	LOS	Peak-Hour Volume	LOS
M-58	US 71 to N. Scott Ave	1,400	1,700	F	1,700	F
M-150	Holmes Rd to US 71	1,700	950	E	900	E
Andrews Rd	M-150 to 155th St	1,500	150	B	100	B
N. Scott Ave	M-58 to Markey Rd	1,500	1,150	E	1,150	E
155th St	US 71 Interchange	1,400	1,450	F	1,400	F
Markey Rd	N. Scott Ave to Westover Rd	1,550	350	C	350	C
Westover Rd	Markey Rd to M-58	1,500	200	C	150	C
Highway Y	M-58 to US 71	1,700	700	D	700	D
US 71	Highway Y to 155th St	5,550	2,750	C	2,750	C

Note: All values have been rounded to the nearest 50.
LOS = Level of Service.

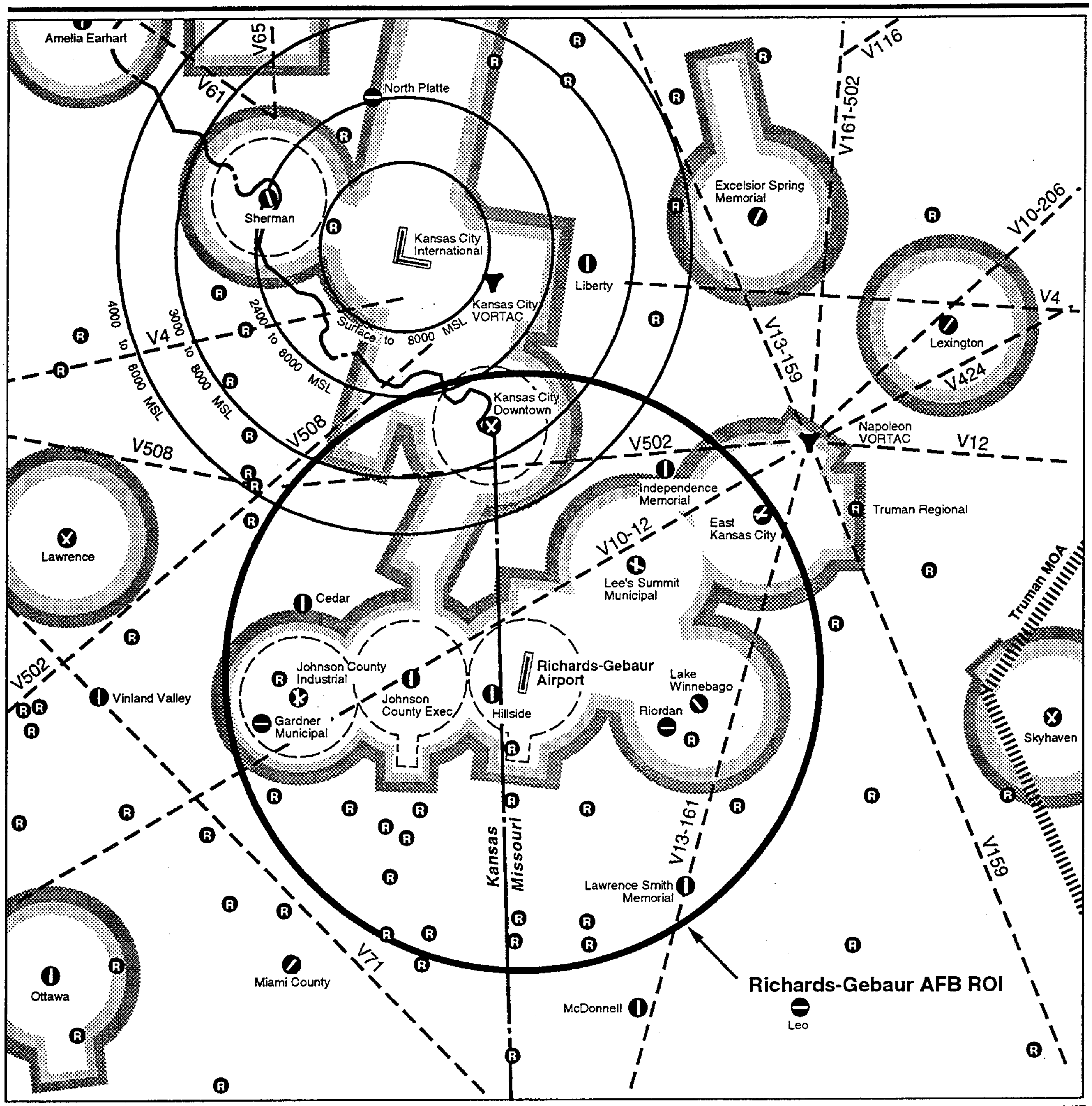
Closure Baseline. Upon closure, there will be a slight reduction in traffic and no change in LOS on local roadways (see Table 3.2-3).

3.2.3.2 Airspace/Air Traffic. Airspace is a finite resource that can be defined vertically and horizontally, as well as temporally, when describing its use for aviation purposes. As such, it must be managed and utilized in a manner that best serves the competing needs of commercial, general, and military aviation interests. The FAA is responsible for the overall management of airspace and has established different airspace designations that are designed to protect aircraft while operating to or from an airport, transiting en route between airports, or operating within "special use" areas identified for defense-related purposes.

Rules of flight and ATC procedures have been established that govern how aircraft must operate within each type of designated airspace. All aircraft operate under either instrument flight rules (IFR) or VFR. IFR aircraft (primarily commercial aviation, military aviation, and business-related general aviation) operate within controlled airspace and are tracked and separated by the ATC system. As of September 16, 1993, controlled airspace is designated as Class A (formerly positive control areas), Class B (formerly terminal control areas), Class D (formerly control zones with an operating control tower and airport traffic areas), Class E (formerly control zones without an operating control tower, general controlled areas, and low-altitude federal airways), and Class G (formerly uncontrolled airspace).

The type and dimension of individual airspace areas established within a given region and their spatial and procedural relationships to one another are contingent upon the different aviation activities conducted in that region. When any significant change is planned for this region, such as airport expansion, a new military flight mission, etc., the FAA will reassess the airspace configuration to determine if such changes will adversely affect (1) ATC systems and/or facilities; (2) movement of other air traffic in the area; or (3) airspace already designated and used for other purposes (i.e., Military Operations Areas [MOAs] or restricted areas).

The airspace ROI selected for Richards-Gebaur AFB consists of a 23-statute-mile radius around Runway 18/36. Approximately 60 percent of the ROI overlies the state of Missouri, with the remainder overlying Kansas. The ROI extends from the surface up to 8,000 feet above MSL in areas not within Class E Airspace (Figure 3.2-10), and includes those areas required for aircraft maneuvering operations associated with Richards-Gebaur Airport. Airspace in this area is under the control of several jurisdictions. The airspace within 5 statute miles, Class D Airspace, is under the control of the Richards-Gebaur Air Traffic Control Tower (ATCT). The 5-statute-mile Class D Airspace around Richards-Gebaur Airport has an extension to the south to encompass traffic on the instrument approach to Runway 36. Class E Airspace extends up to 18,000 feet and is in effect when the weather is



EXPLANATION

- Public Use Airport
- Restricted/Private Use Airport
- Kansas City Class B Airspace
- Class D/E Airspace
- Very High Frequency Omnidirectional Range Tactical (VORTAC) Air Navigation System
- Transitional Airspace
- Military Operations Area
- Victor Airway
- ROI
- State Line

0 2.875 5.75 11.5 Statute Miles

ROI is 23-statute mile radius from Richards-Gebaur Airport.

Airspace Region of Influence

Figure 3.2-10

worse than instrument meteorological conditions (1,000-foot ceiling and 3-mile visibility).

Within the ROI, the Kansas City Class B Airspace affects traffic north of Richards-Gebaur AFB. Class B Airspace starts 10 statute miles north of the runway, and serves to control the high volume of air traffic around KCI, 35 statute miles north-northwest of Richards-Gebaur AFB. Class B Airspace extends to 8,000 feet MSL and its floor drops from 4,000 to 2,400 feet above MSL toward KCI. Aircraft operating below or above Class B Airspace are unaffected by it. Within Class B Airspace, all VFR and IFR traffic is under control of the Kansas City Approach Control or Departure Control.

There are numerous other airports in the ROI, most without control towers and associated Class D Airspace. Airports of note include Kansas City Downtown, 20 statute miles north of Richards-Gebaur AFB. This airport has an ATCT and associated Class D Airspace. Because of its instrument approach, Kansas City Downtown has Class D and E Airspace. The two other airports with ATCTs and associated Class D Airspace are Johnson County Executive, 10.5 statute miles west of Richards-Gebaur AFB, and Johnson County Industrial Airport, 17.5 statute miles west of the base. All other airspace in the ROI is under the jurisdiction of the Kansas Air Route Traffic Control Center (ARTCC).

Preclosure Reference. An understanding of the ROI airspace/air traffic environment and its use under the preclosure reference is necessary to help determine its capability and capacity to assimilate future aviation activities into the National Airspace System (NAS). The same constraints and considerations such as terrain, runway alignments, and other air traffic flows would apply under alternate aviation uses of Richards-Gebaur Airport.

The Richards-Gebaur ATCT controls all air traffic, whether transitioning or base related, within its Class D Airspace from 7:00 a.m. to 10:00 p.m. Class D/E Airspace, in effect during IFR weather when the ATCT is open, limits VFR operations in order to protect IFR operations. Because the majority of the military aircraft operations are conducted by the A-10 aircraft, which operate under VFR as much as the weather allows, this traffic is generally required to contact only the ATCT.

There is no radar approach control (RAPCON) or similar facility based at Richards-Gebaur Airport. Outside Class D/E Airspace, operations are affected only by the Kansas City Class B Airspace and the Class D/E Airspace, associated with Johnson County Executive, Johnson County Industrial, and Kansas City Downtown airports. Air traffic through the Class B Airspace must be in contact with Kansas City Approach Control or Departure Control. Richards-Gebaur ATCT operates under an agreement with the Class B Airspace and KCI ATCT to facilitate the handling of traffic.

Military traffic outside Class B, D, or E Airspace operates according to the applicable FAA regulations. The 442nd FW also adheres to Air Force regulations. Figure 3.2-11 shows the primary VFR flight tracks used by aircraft operating at Richards-Gebaur AFB. The pattern altitude is 2,200 feet above MSL and 1,700 feet above MSL for light aircraft (aircraft with a maximum gross takeoff weight of 12,500 pounds or less). Numbers of military and civil aviation operations at Richards-Gebaur Airport in 1992 are presented in Table 3.2-4.

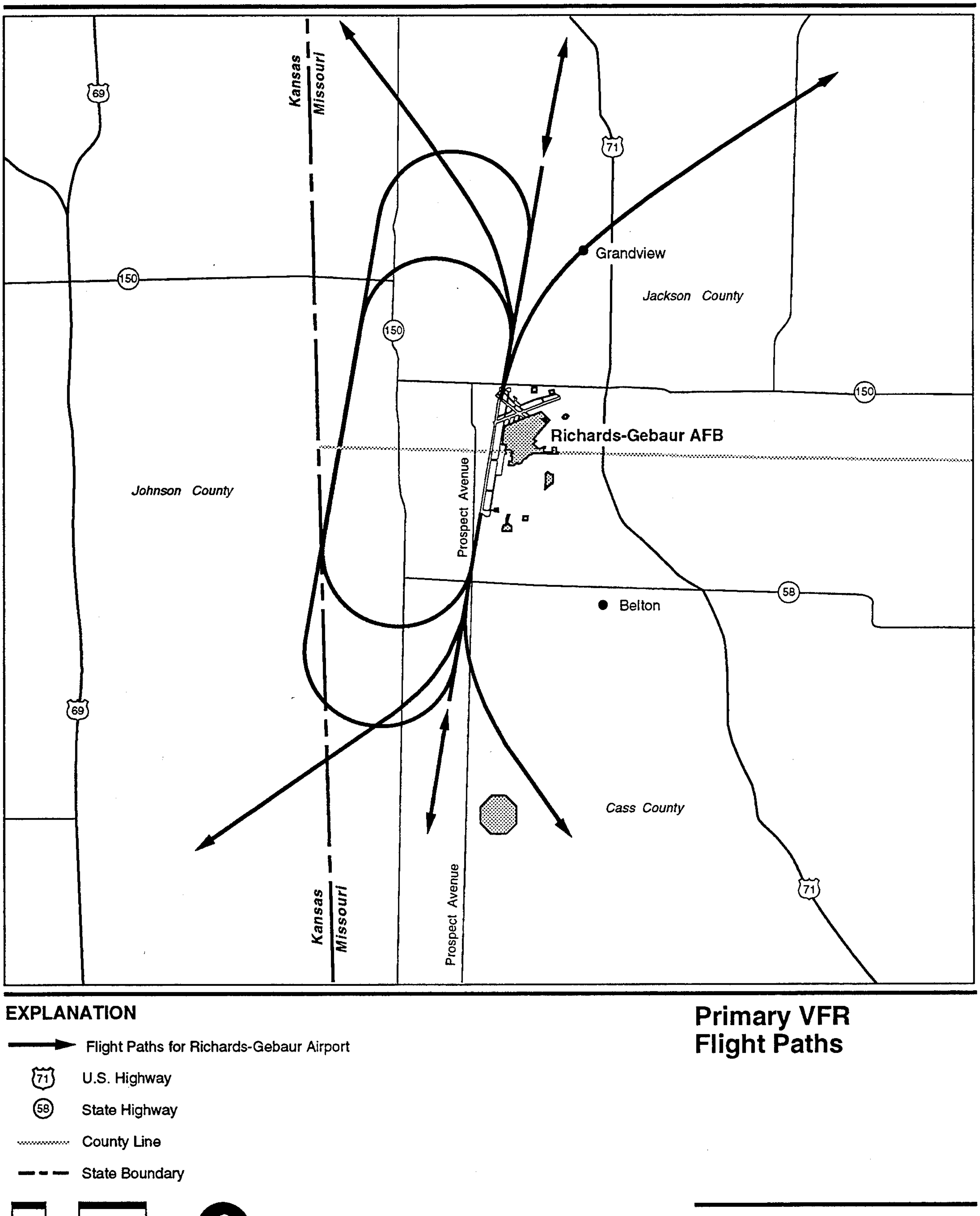
Table 3.2-4. Richards-Gebaur Airport Annual Aircraft Operations, 1992

	Aircraft Operations			
Assignment	Type	Day	Night	Total
Military Aircraft				
Military-Based Aircraft	A-10	4,653	0	4,653
Primary Military Transient Aircraft	A-3/4/6/7	99	0	99
	C-130/141	692	0	692
	C-5/7/8/12/21	333	0	333
	CH-47/53	101	0	101
	F-4/5/14/15/16/18/27	241	0	241
	KC-10	192	0	192
	KC-135	38	0	38
	P-3	186	0	186
	T-33/37/38/47	1,530	0	1,530
	UH-1/60	163	0	163
Other Military Transients	Miscellaneous Jet	108	0	108
Total Military		8,336	0	8,336
General Aviation Aircraft	Single-engine Piston	23,551	481	24,032
	Multi-engine Piston	1,752	36	1,788
	Turboprop	1,853	38	1,891
	Turbojet	720	15	735
	Helicopter	228	5	233
Total General Aviation		28,104	575	28,679
Totals		36,440	575	37,015

Note: An aircraft operation is one takeoff or one landing.
Source: Kansas City Aviation Department, 1992.

Traffic destined for KCI generally enters Class B Airspace from several directions. Operations to or from the south travel over Richards-Gebaur Airport at or above 7,000 feet above MSL. Under VFR, this traffic is well above Class D Airspace and does not affect Richards-Gebaur Airport operations. Under IFR, contact with Kansas City Approach Control would be established when the aircraft fly through Class E Airspace. There is no interference with other traffic because all IFR traffic in Class E Airspace is under control of the Kansas City Approach/Departure Control.

Several Victor airways, used by commercial aircraft, transit the ROI. Victor airways pose no special impact on traffic within the ROI.



Primary VFR Flight Paths

Figure 3.2-11

Aircraft from the 442nd FW practice in the Truman MOA, 35 statute miles east of Richards-Gebaur AFB, outside the ROI.

Closure Baseline. Closure of the base will not affect civilian air traffic control. The KCAD will operate the ATCT as necessary to support civilian airport activities, so Class D Airspace would remain in effect. If the KCAD and/or the FAA decide it is feasible to keep the instrument approaches in effect, Class E Airspace will also remain in effect. The Victor airways and other airports would be unaffected by the closure. General aviation operations at Richards-Gebaur Airport would continue (Table 3.2-5), and would increase from preclosure conditions.

Table 3.2-5. Richards-Gebaur Airport Projected Annual Aircraft Operations, 1994

				Aircraft Operations			
Year	Activity	Function	Percent	Fleet Mix	Day	Night	Total
Closure	Military	Transient	25	A-10	250	0	250
			2	A-3/4/6/7	20	0	20
			14	C-130/141	141	0	141
			7	C-5/7/9/12/21	68	0	68
			2	CH-47/53	21	0	21
			5	F-4/5/14/15/16/18/27	49	0	49
			4	KC-10	39	0	39
			1	KC-135	8	0	8
			4	P-3	38	0	38
			31	T-33/37/38/47	312	0	312
			3	UH-1/60	33	0	33
			2	Miscellaneous Jet	22	0	22
	General Aviation	Private Aircraft	83	Single-engine Piston	30,909	631	31,540
			6	Multi-engine Piston	2,234	46	2,280
			7	Turboprop	3,073	53	3,126
			3	Turbojet	1,117	23	1,140
			1	Bell Helicopter	372	8	380
	Total				38,706	761	39,467

Note: An aircraft operation is one takeoff or one landing.

The relocation of the 442nd FW to Whiteman AFB will have no effect on ROI airspace other than a reduction in military traffic. The Truman MOA will continue to be used by the 442nd FW and will remain unchanged.

3.2.3.3 Air Transportation. Air transportation includes passenger travel by commercial airline and charter flights, business and recreational travel by private (general) aviation, and priority package and freight delivery by commercial air carriers.

In 1992, there were no airports within Richards-Gebaur AFB's ROI that provided scheduled passenger service. There are plans to install commuter gates at Kansas City Downtown Airport in late 1993 and begin commuter services within 5 years thereafter. KCI serves as a commercial passenger airport for the eight-county Kansas City metropolitan area. This facility recorded over 3.7 million passengers boarded in calendar year 1992. During this same period, approximately 107 metric tons of cargo (freight and mail) were loaded and unloaded at this airport. Table 3.2-6 presents the historic (1990) and projected annual operations at selected civil public-use airports within the ROI. There are also numerous private-use facilities within the ROI, but these facilities are primarily airstrips used for agricultural purposes and each typically accounts for less than 500 annual aircraft operations.

Table 3.2-6. Existing and Closure Baseline Projected Annual Aircraft Operations for Selected Civil Public-Use Airports in the ROI

	Annual Operations	
Airport	1990	1994
Gardner Municipal	11,048	10,740
Johnson County Executive	131,172	136,477
Johnson County Industrial	76,874	86,646
Kansas City Downtown	153,974	142,747
Lake Winnebago	13,016	8,355
Lawrence Smith Memorial	7,625	10,872
Lee's Summit Municipal	57,184	71,637

Note: An aircraft operation is one takeoff or one landing.
ROI = Region of Influence.

Source: Mid-America Regional Council, 1990a.

No loss of passenger traffic is expected due to the transfer of the 442nd FW from Richards-Gebaur AFB in October 1994.

3.2.3.4 Other Transportation Modes. Rail service is not available at Richards-Gebaur AFB, but Kansas City is the second most important rail center in the United States. A KCSL main line west of the base handles 10 to 16 trains per day between Kansas City and the Gulf Coast. The trains consist of general freight, intermodal, and unit grain and coal trains. Burlington-Northern railroad abandoned the line just west of US 71 in 1988. KCSL now provides service to a plastics manufacturer located off 155th Street and track has been removed just south of that service. Upon closure of Richards-Gebaur AFB there would be no notable change in railroad activity in the local area.

3.2.4 Utilities

The utility systems addressed in this analysis include the facilities and infrastructure used for:

- Potable water pumping, treatment, storage and distribution
- Wastewater collection and treatment
- Solid waste collection and disposal
- Energy generation and distribution, including the provision of electricity and natural gas.

The ROI for utilities is made up of the service areas of each utility provider servicing the base and local community. The major attributes of utility systems in the ROI are processing, distribution and storage capacities, and related factors, such as average daily consumption and peak demand, that are required in making a determination of adequacy of such systems to provide services in the future.

Projected utility use at the time of closure (1994) for water, wastewater, and solid waste were developed based on discussions with the purveyors. Projected use of electricity and natural gas were developed using historic consumption patterns and system-wide average annual growth rates. All projections were adjusted to reflect the decrease in use associated with base closure. All utility services on Richards-Gebaur AFB are provided by local community providers; there are no base-operated utility services.

Water Supply. The ROI for water supply consists of the areas served by Kansas City, Missouri. The Kansas City Water and Pollution Control Department draws water from the Missouri River and provides it to its residents and 30 wholesale customers in four counties, including the Jackson County Water District and the city of Belton. Treatment before distribution includes presedimentation, coagulation, stabilization, filtration, and chlorination. The system capacity is 230 million gallons per day (MGD). Kansas City's capital improvement program has identified various projects to improve plant operation and provide additional pump stations, reservoirs, and transmission mains by approximately 2000.

Kansas City provides water to Richards-Gebaur AFB via two connections. On-base water storage facilities include a 1,060,000-gallon underground reservoir, a 50,000-gallon in-ground tank, and a 400,000-gallon elevated tower. Cass County Water Supply District No. 2 provides water to that portion of the county that includes the Belton Training Complex. The District receives its water supply from Kansas City.

Wastewater. The ROI for wastewater consists of the areas served by Kansas City, Belton, and the Little Blue Valley Sewer District. Kansas City has eight wastewater treatment plants with a combined capacity of 152 MGD. A portion of Kansas City's sewer system is still combined with storm sewers. Belton's present wastewater treatment plant has a design capacity of 1.4 MGD; it is to be replaced by a new 2.5-MGD plant, which should be operational in summer 1994. The Little Blue Valley Sewer District's plant has an average daily capacity of 40 MGD.

Wastewater generated on Richards-Gebaur AFB is collected and discharged to the Little Blue Valley Sewer District interceptor B. Actual wastewater flows from the base are not measured; flow estimates for billing purposes are based on water consumption. The base's sewer system does experience some inflow as a result of groundwater levels and the condition of the system. Septic systems are in use at the Air Traffic Transceiver, Small Arms Range, and Mobile Radio Transceiver.

Solid Waste. The ROI for solid waste disposal consists of waste disposal facilities that serve the seven-county Kansas City metropolitan area. Solid waste is deposited in three major public landfills and four privately-operated landfills. The landfill lifespans range from 1.5 to 20 years, averaging 7 years. Expansion plans for three of the facilities, to be implemented by 2000, would extend the lifespan of each by 10 to 20 years. There are six additional landfills in communities surrounding the metropolitan area. None of the 13 landfills is within 10,000 feet of the runways, and aircraft operations are not affected by bird populations feeding at the landfills.

Solid waste generated on Richards-Gebaur AFB is hauled off base by a commercial hauler and deposited in the Johnson County landfill in Shawnee, Kansas. Medical wastes are collected and disposed off base by a private contractor.

Electricity. The ROI for electricity consists of the local service areas of Missouri Public Service (MPS) and Kansas City Power and Light (KCP&L). The service area for KCP&L includes a small portion of central Missouri, but the immediate base area represents only about 5 percent of their load. KCP&L and MPS provide electrical power to 440,000 customers in the Kansas City metropolitan area. The KCP&L system has the capacity to meet a summer peak demand of 3,089 megawatts (MW) and in 1991 had sales of 30,738 MWH/day. In the same year, MPS sold 1,324 MWH/day to 24,000 customers.

MPS provides electricity to Richards-Gebaur AFB through two substations. The north substation, with a 3,750-kilovolt ampere (kVA) capacity, provides primary service to the cantonment. A tie-in from the 7,500-kVA south substation is available as an alternate.

Natural Gas. Gas Service, a division of Western Resources Inc., provided natural gas to customers in the Kansas City metropolitan area and southwestern Missouri until early 1994. In 1991, the company had 1,080,000 customers. In February 1994, Missouri Gas Energy purchased the natural gas service area in Missouri from Western Resources, Inc.

Missouri Gas Energy provides natural gas to the base via high-pressure pipelines that run along 155th Street and Markey Road. A natural gas-fired central heating plant, operated by Kansas City, provides steam to some of the buildings on base; other buildings are heated by natural gas or electricity.

Preclosure Reference. Table 3.2-7 presents the preclosure utility use in the ROI, projected to closure in 1994. Prior to closure, on-base utility consumption was equal to or less than 1 percent of total consumption in the ROI.

Table 3.2-7. Estimated Utility Use in the ROI

	1991	1992	1993	1994
Water Consumption (MGD)	110	97	99	102
Wastewater Treatment (MGD)	122	124	126	127
Solid Waste Disposal (tons per day)	4,575	4,620	4,670	4,715
Electrical Consumption (MWH/day)	32,062	30,735	32,700	33,467
Natural Gas Consumption (MMCF/day)	618	541	603	610

MGD = million gallons per day.
MMCF/day = million cubic feet per day.
MWH/day = megawatt-hours per day.
ROI = Region of Influence.

Closure Baseline. Projected utility consumption in the ROI is expected to increase from 1992 to 1994 as a result of population growth in the area (see Table 3.2-7). As drawdown of base activities proceeds, utility consumption on base will decrease. On-base utility consumption in September 1994 is estimated to be less than 1 percent of preclosure base consumption. The city has recommended closing the central heating plant and installing gas-fired steam boilers in each building currently served by the central plant.

3.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT

Hazardous materials and hazardous waste management activities at Richards-Gebaur AFB are governed by specific environmental regulations. For the purpose of the following analysis, the term hazardous waste or

hazardous material will mean those substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §9601-9675, as amended, and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6901-6992, as amended. In general, this includes substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or welfare or the environment when released to the environment.

The state of Missouri regulates hazardous waste management under the Code of State Regulations (CSR). Specifically, the Missouri Department of Natural Resources (MDNR) enforces Title 10 of the CSR, which regulates the following divisions pertinent to hazardous materials and hazardous waste management: Clean Water Commission (Division 20; 10 CSR 20), Hazardous Substance Emergency Response Office (Division 24; 10 CSR 24), and the Hazardous Waste Management Commission (Division 25; 10 CSR 25).

Transportation of hazardous materials is regulated by DOT regulations within Chapter 49 of the CFR. The state of Missouri regulates the transportation of hazardous waste under 10 CSR 25 Chapter 6. Treatment and disposal of nonhazardous waste, including wastewater, is discussed in Section 3.2.4 as part of infrastructure support.

The ROI encompasses all geographic areas that are exposed to the possibility of a release of hazardous materials or hazardous wastes. The ROI for known contaminated sites is within the existing base boundaries. Specific geographic areas affected by past and current hazardous waste operations, including cleanup activities, are presented in detail in the following sections.

3.3.1 Hazardous Materials Management

Hazardous or toxic materials are substances that are flammable or combustible, corrosive, an oxidizing agent, explosive, toxic, or radioactive. Potential hazardous substances are those that, because of their specific properties, would become hazardous when making contact with another substance. Hazardous materials at Richards-Gebaur AFB are managed according to the United States Air Force Supply Manual, AFM 67-1, Volume 2. The Bioenvironmental Engineering Technician reviews and approves Base Supply's procurements and manages issues of hazardous or toxic materials. The Bioenvironmental Engineering Technician has the responsibility to ensure that toxic or hazardous materials are used in such a manner that they do not endanger the health of Air Force personnel, and that their use does not endanger community health.

Preclosure Reference. The primary hazardous materials used at the base are jet fuels; petroleum, oil, and lubricants (POL); antifreeze; paints; batteries; acids; adhesives; aircraft cleaning compounds; glues; inks; electron tubes; paint strippers; metal degreasers; photochemicals; aqueous fire fighting foam (AFFF); compressed gases; and commercial degreasers. All incoming hazardous materials, with the exception of fuels, are delivered to Base Supply, where the Bioenvironmental Engineering Technician signs for the material. Hazardous materials warranting segregated storage are separated and stored in predetermined areas within the Base Supply complex. Copies of Material Safety Data Sheets (MSDSs) are kept by the Bioenvironmental Engineering Technician, Base Supply, and by the end users. Fuels are delivered to fuel distribution points at the POL tank farm and the government vehicle filling station. In 1992 the two largest bulk fuel tanks at the POL tank farm dispensed 3,644,883 gallons of jet fuel. Motor gasoline (MOGAS) and diesel fuel are stored in two 10,000-gallon aboveground storage tanks at the government vehicle filling station. In 1992 the base dispensed 36,813 gallons of MOGAS and 23,013 gallons of diesel fuel.

Stored hazardous materials are also managed in accordance with the Operational Plan For Spill Prevention, Control, and Countermeasures (SPCC) Plan published by the Base Civil Engineer. The plan is formatted according to the specifications in 40 CFR 112, U.S. EPA regulations on oil pollution prevention. The SPCC Plan sets forth procedures for the storage of hazardous materials as well as the prevention, containment, and notification of spills of aviation fuels, engine and equipment oils, petroleum based solvents, heating oil, diesel fuel, MOGAS, hydraulic fluid, calibrating fluid, and purging fluid. The SPCC Plan includes a detailed description of each facility where hazardous materials are stored or handled. The SPCC Plan also lists all hazardous materials at the facility and provides site-specific contingency plans.

The MDNR requires the reporting of Emergency Planning and Community Right-To-Know Act (EPCRA) information under 10 CSR 24. This rule establishes reporting procedures in Missouri to comply with state and federal EPCRA (42 U.S.C. §§11001 et seq.). EPCRA reporting for federal facilities became mandatory on August 3, 1993, by Executive Order 12856. This includes the reporting of extremely hazardous substances at or above threshold planning quantities to the Local Emergency Planning Committee (LEPC) and the Missouri Emergency Response Commission (MERC).

Closure Baseline. At base closure, only the OL will be using hazardous materials. All parties will be responsible for managing these materials in accordance with federal, state, and local regulations to protect their employees from occupational exposure to hazardous materials and to protect the public health of the surrounding community. The OL will be responsible for the safe storage and handling of all hazardous and toxic materials used in conjunction with all base maintenance materials, such as paint, paint

thinner, solvents, corrosives, ignitables, pesticides, and miscellaneous materials associated with vehicle and machinery maintenance (motor oils/fuels). These materials will be delivered to the base in compliance with the Hazardous Materials Transportation Act (HMTA).

3.3.2 Hazardous Waste Management

Preclosure Reference. Operations at Richards-Gebaur AFB currently produce waste defined as hazardous by RCRA, 40 CFR 261-265 and Missouri 10 CSR 25. Richards-Gebaur AFB has obtained an EPA hazardous waste generator identification number and an MDNR hazardous waste generator identification number. The base generates less than 1,000 kilograms of hazardous waste per month and is therefore defined as a Small Quantity Generator (SQG) under RCRA. SQGs are required to obtain a generator identification number and are allowed longer storage periods before Treatment Storage Disposal (TSD) permitting requirements under RCRA are triggered. SQGs may store hazardous waste on site for up to 180 days without an RCRA storage permit, provided that the total amount of waste does not exceed 6,000 kilograms. If any hazardous waste must be transported for disposal more than 200 miles, the SQG may accumulate such hazardous wastes for up to 270 days without a permit. A further requirement is that an employee must be on site or on call to handle any emergencies. Richards-Gebaur AFB uses several methods of handling hazardous waste, including recycling, reuse, reclamation, neutralization, or disposal at a TSD-permitted facility.

Hazardous wastes are generated by Richards-Gebaur AFB during general maintenance and aircraft repair operations and other industrial operations. RCRA-defined hazardous wastes generated on base include fuels, oils, hydraulic fluid, paint, paint thinners, solvents, and batteries. The base also generates wastes such as used motor oil and waste cleaning compounds, which are not regulated under RCRA but are regulated by Missouri.

Hazardous wastes at Richards-Gebaur AFB are stored at 21 designated hazardous waste accumulation points (Table 3.3-1). There are 20 Initial Accumulation Points (IAPs), two of which have separate areas for segregated storage of various types of wastes, and one central hazardous waste storage facility on base. Hazardous wastes can be stored in the IAPs in amounts up to 90 percent of the container volume, up to a maximum of 55 gallons, or for up to 1 year from the start of accumulation. After one of these criteria is met, the hazardous waste is transferred to the central hazardous waste storage facility, where it is held pending off-base disposal. Richards-Gebaur AFB disposes of hazardous waste in cooperation with the Defense Reutilization and Marketing Office (DRMO) at Whiteman AFB, Missouri. The DRMO arranges for a licensed contractor to remove hazardous waste off base to a TSD-permitted facility. Hazardous waste is shipped off base in compliance with MDNR and RCRA regulations;

Table 3.3-1. Accumulation Points

Number	Facility/Description	Building Location
1	Munitions Storage	1202
2	Weapon Release	828
3	Refueling Repair	711
4	Corrosion Control	965
5	Lead Acid Battery Shop	918
6	Nickel-Cadmium Battery Shop	918
7	Pneudraulic Shop	927
8	Repair and Reclamation Shop	966
9	Propulsion	927/928
10	AGE Shop	958/959
11	Fuel Systems	972/948
12	Photo Lab	710
13	NDI Shop	839
14A	Vehicle Maintenance (Oils)	704
14B	Vehicle Maintenance (Asbestos)	704
14C	Vehicle Maintenance (Paint-Related Material)	704
15	Hospital	601
16A	Base Supply (Batteries)	610
16B	Base Supply (Solids)	610
16C	Base Supply (Liquids)	610
16D	Base Supply (Diminished Shelf Life)	610
17	Paint Shop	605
18[a]	Hazardous Waste Storage Facility	973
19	POL Storage	953
20	Refueler Parking	970
21	Motor Pool Fuel Storage	701

Notes: All accumulation points (except number 18) are initial accumulation points.
(a) Location of storage for hazardous waste pending disposal off base.
AGE = aerospace ground equipment.
IAP = Initial Accumulation Point.
NDI = nondestructive inspection.
POL = petroleum, oil, and lubricants.

shipments and pertinent paperwork are regularly inspected by DRMO for conformity with applicable regulations.

The Base Environmental Engineer is responsible for hazardous waste management at Richards-Gebaur AFB. The Base Environmental Engineer controls hazardous waste management on base primarily by implementing the Hazardous Waste Management Plan (HWMP). This plan provides a framework of safe handling procedures and "cradle to grave" tracking documentation with full accountability. The plan details the processing of hazardous waste in the accumulation points. The HWMP provides for the base Fire Department to support emergency responses, spill events, exercises, and fire protection activities. In addition, the Fire Department is responsible for making periodic fire safety inspections of accumulation points. The HWMP tasks the Base Environmental Engineer with annual verifications of the waste streams and the waste generating process, and assigns a manager to each IAP who conducts a weekly inspection of the IAP. The Richards-Gebaur AFB SPCC Plan specifies procedures to be followed in the event of a spill or release of hazardous substance. These procedures include spill detection, reporting, containment, cleanup, and disposal protocols.

The flightline runoff detention reservoir at the northern end of the Cantonment, just west of the POL Storage Yard, is an area of concern regarding potential contamination with hazardous wastes. The reservoir was constructed in 1975 to capture and retain flightline runoff, allowing time for the effluent to pass through an oil/water separator (OWS). The reservoir is unlined and has been noted as having an oil sheen at times. The base plans an investigation to determine if contaminants have concentrated in reservoir sediments.

Closure Baseline. At the time of closure, all of the hazardous waste generated by base functions will have been collected from the designated hazardous waste accumulation points and disposed off site in accordance with RCRA. Non-RCRA wastes will be similarly disposed of in accordance with MDNR regulations under 10 CSR 25. Hazardous waste generated by the OL will be managed to ensure proper identification, storage, transportation, and disposal as well as implementation of waste minimization programs.

3.3.3 Installation Restoration Program (IRP) Sites

The IRP is an Air Force program to identify, characterize, and remediate past environmental contamination on its installations. Although widely accepted at the time, procedures followed prior to the mid-1970s for managing and disposing of many wastes often resulted in contamination of the environment. The program has established a process to evaluate past disposal sites, control the migration of contaminants, and control potential

hazards to human health and the environment. Section 211 of the Superfund Amendments and Reauthorization Act (SARA), codified as the Defense Environmental Restoration Program (DERP), of which the Air Force IRP is a subset, ensures that DOD has the authority to conduct its own environmental restoration programs. DOD coordinates IRP activities with the U.S. EPA and appropriate state agencies.

Prior to the passage of SARA and the establishment of the National Contingency Plan (NCP) for hazardous waste sites, Air Force IRP procedures followed DOD policy guidelines mirroring the U.S. EPA Superfund Program. Since SARA was passed, many federal facilities have been placed on a federal docket and the U.S. EPA has been evaluating the facilities' waste sites for possible inclusion on the National Priorities List (NPL). Richards-Gebaur AFB has not been placed on the NPL. The base has entered into a cooperative agreement with the MDNR for oversight and guidance during the IRP. The Defense-State Memorandum of Agreement (DSMOA) defines state and Air Force responsibilities during the IRP for all Air Force facilities within Missouri. The state will review, comment, and make recommendations on project plans, identify state applicable or relevant and appropriate regulations, and participate in the Restoration Advisory Board. A designated state project manager will participate in planning and review processes.

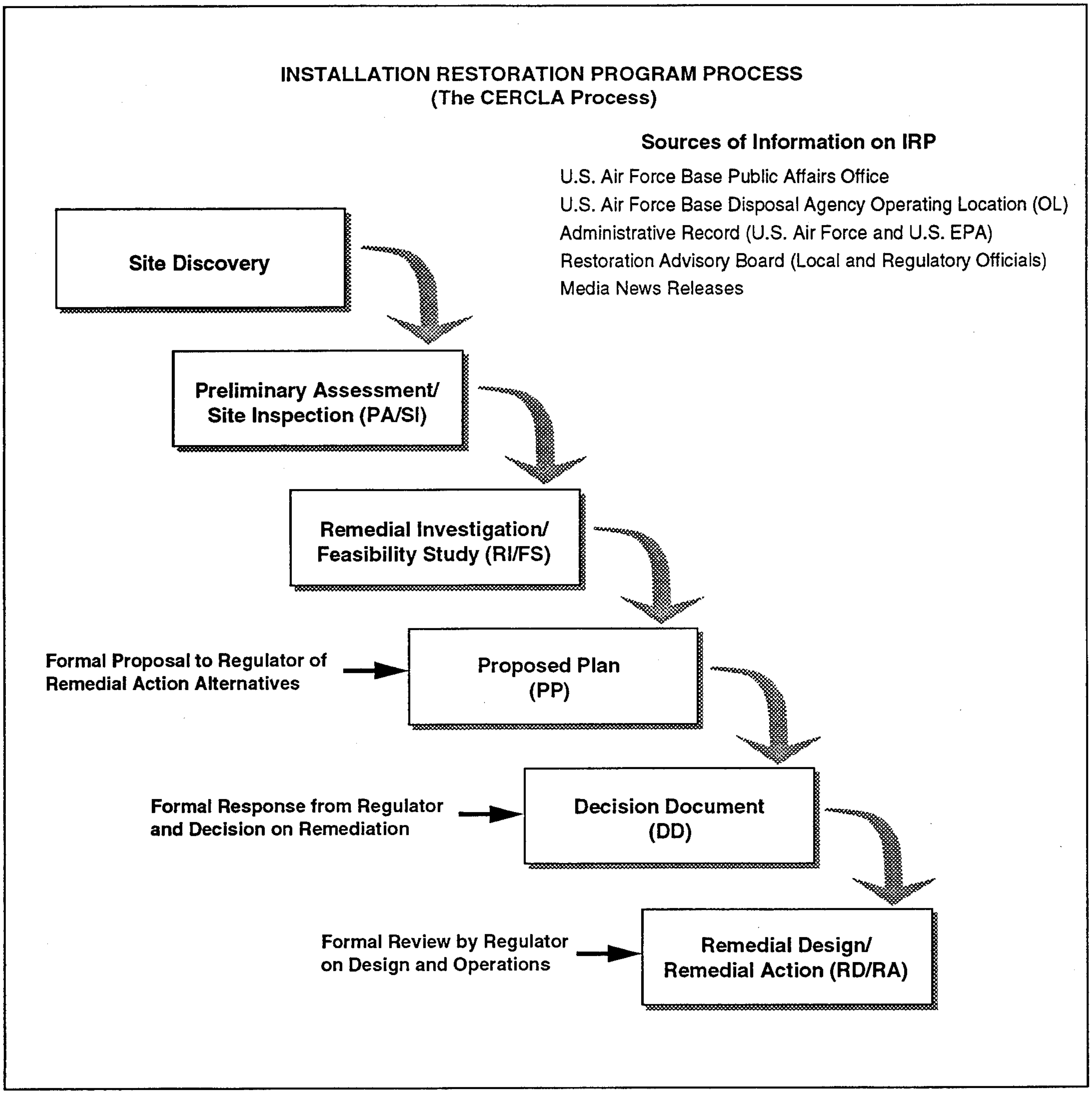
Ongoing activities at the identified IRP sites may delay or limit some proposed land uses at or near those sites. Future land uses by the recipients on a site-specific level may be, to a certain extent, limited by the severity of contamination or level of remediation effort at these IRP sites. Reasonably foreseeable land use constraints are discussed in this EIS. Regulatory review as required by federal and state regulators as well as Air Force programs will ensure that any site-specific land use limitations are identified and considered. A representation of the IRP management process followed at Richards-Gebaur AFB is shown in Figure 3.3-1.

The original IRP was divided into four phases, consistent with CERCLA:

- Phase I: Problem Identification and Records Search
- Phase II: Problem Confirmation and Quantification
- Phase III: Technology Development (TD)
- Phase IV: Corrective Action.

After SARA was passed in 1986, the IRP was realigned to incorporate the terminology used by the U.S. EPA and to integrate the new requirements in the NCP. The result was the creation of three action stages:

- Preliminary Assessment/Site Inspection (PA/SI)
- Remedial Investigation/Feasibility Study (RI/FS)
- Remedial Design/Remedial Action (RD/RA).



Pictorial Presentation of IRP Process

Figure 3.3-1

The PA portion of the first stage under the NCP is comparable to the original IRP Phase I and consists of a records search and interviews to determine whether potential problems exist. A brief SI that may include soil and water sampling is performed to give an initial characterization or confirm the presence or absence of contamination at a potential site.

An RI is similar to the original Phase II and consists of additional field work and evaluations in order to assess the nature and extent of contamination. It includes a risk assessment and determines the need for site remediation.

The original IRP Phase IV has been replaced by the FS and the RD within the third stage. The FS documents the development, evaluation, and selection of alternatives to remediate the site. The selected alternative is then designed (RD) and implemented (RA). Long-term monitoring is often performed in association with site remediation to assure future compliance with contaminant standards or achievement of remediation goals. The Phase III portion of the original IRP process is not included in the normal SARA process. TD under SARA is done under separate processes including the Superfund Innovative Technology Evaluation program. The Air Force has an active TD program in cooperation with the U.S. EPA to find solutions to problems common to Air Force facilities. Because the Air Force began the IRP process at Richards-Gebaur AFB in 1982, prior to terminology and procedural changes, both phases and stages are combined in the IRP administrative record.

The closure of Richards-Gebaur AFB will not affect the ongoing IRP activity. These IRP activities, managed by the OL, will continue in accordance with federal, state, and local regulations to protect human health and the environment, regardless of the disposal decision. The Air Force will retain any necessary interests (e.g., easements) in order to perform operations and maintenance on all remediation systems. The DSMOA between Missouri and the Air Force will remain in effect to ensure joint involvement in the IRP.

The public may keep abreast of the IRP at Richards-Gebaur AFB through various sources of information including the public/open viewing of IRP documents at the Headquarters Building (Public Affairs Office) during business hours and by public releases prepared on an as-needed basis for items such as a Decision Document (DD). The Air Force will, with the acceptance of each RI/FS by the regulatory community, prepare a proposed plan for the remediation of a site(s) which will include a discussion of the alternatives considered. The proposed plan will be distributed to the regulatory agencies for comment. The Air Force will then respond to all comments, making those responses part of a DD on what the remediation will entail prior to any remedial action being taken.

Preclosure Reference. The IRP at Richards-Gebaur AFB started with the Phase I Records Search in 1983, which identified nine potential disposal

sites. Of these, seven were on property that was conveyed to Kansas City in 1985; the Army Corps of Engineers has responsibility for remediation of those seven sites. The other two sites (FT-002, a former fire training area, and SS-003, an oil saturated area) are on Air Force property and are part of the continuing IRP at Richards-Gebaur AFB. The Phase I Records Search found no evidence to indicate the presence of contamination at the Belton Training Complex or migration of contamination onto off-base property.

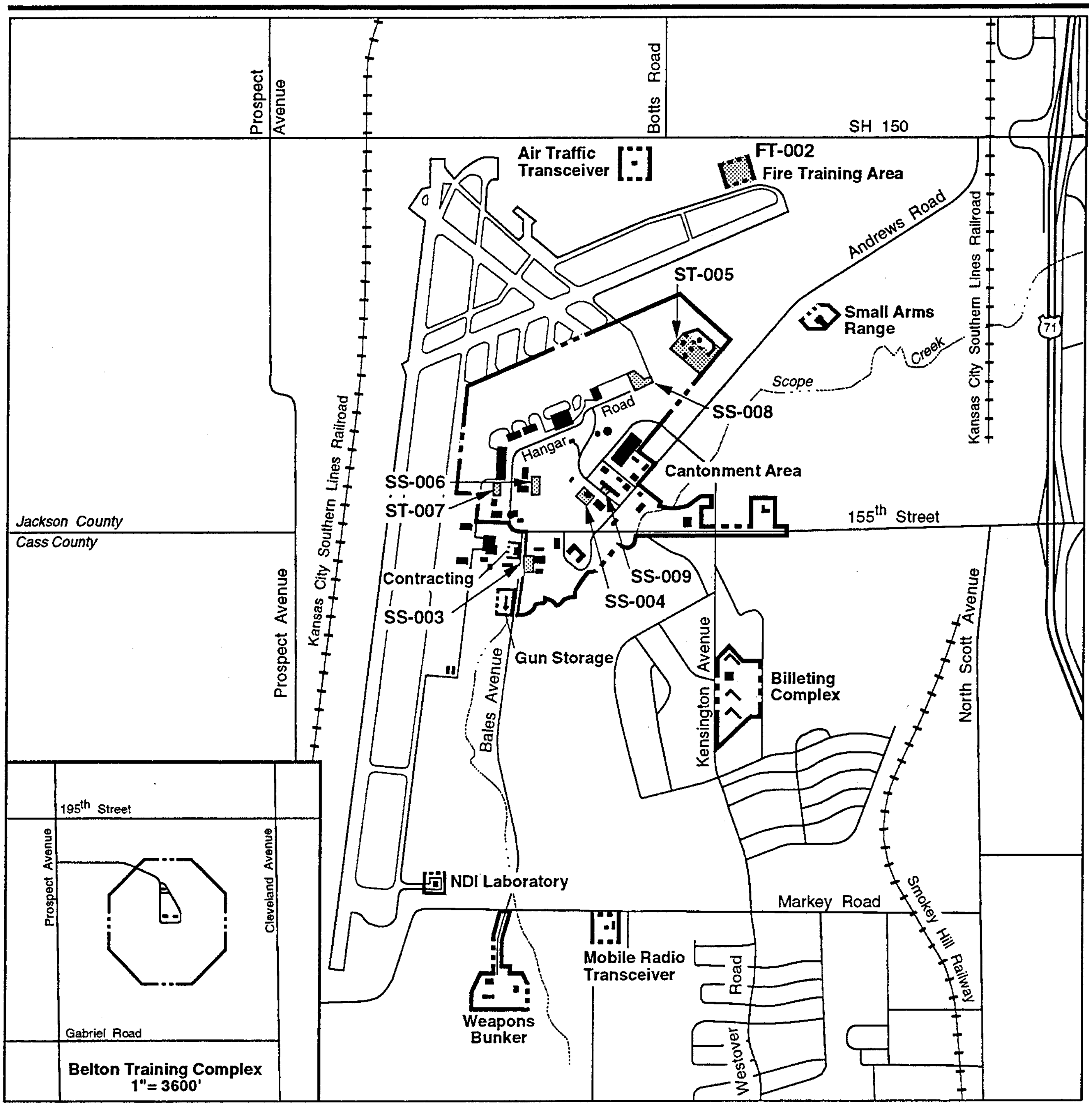
Phase II studies in 1988 identified one additional site, SS-004, a hazardous waste drum storage area. Sites ST-005, the POL Storage Yard, and SS-006, a hazardous material storage facility, were identified in a 1990 SI. Site ST-007, underground storage tanks (USTs), was discovered in 1988 at the time of a UST removal project. Sites SS-008, the test cell area, and SS-009, the fire valve area, were identified during soil excavation projects in 1991 and 1992, respectively.

No Further Action Planned (NFAP) DDs have been submitted to MDNR and the U.S. EPA for sites SS-003, SS-004, and ST-007, and the base is awaiting comments or concurrence on these three sites. A No Further Action With Deed Restriction DD was filed for Site FT-002 in 1990, but it was rejected by MDNR and U.S. EPA. A subsequent (1992) RI showed no groundwater contamination, and no further action for groundwater is recommended at this site. Landfarming is the selected remedial action for Site ST-005; remediation was begun in 1993, and the site is in the RD/RA stage. An interim remedial action (IRA) at SS-006 and an SI at SS-008 were conducted in summer 1993; reports detailing results and recommendations are being reviewed by MDNR. Site SS-009 was identified only recently and no published information is available yet. A PA/SI is under way and will be completed in early 1994.

As of November 1993, there were eight IRP sites at Richards-Gebaur AFB. Locations of all eight sites are shown on Figure 3.3-2. IRP site descriptions, including location and waste description, are provided in Table 3.3-2.

Closure Baseline. The closure of Richards-Gebaur AFB will not affect the ongoing IRP activity. These IRP activities will continue in accordance with federal EPA, state, and local regulatory agency regulations to protect human health and the environment, regardless of the alternatives chosen for reuse. The DSMOA between Missouri and the Air Force will remain in effect to ensure joint involvement in the IRP.

IRP remedial activities will continue well past the September 1994 closure date for Richards-Gebaur AFB. The OL will remain after closure and oversee the coordination of the contractors and assure that U.S. EPA and MDNR as well as local regulatory agency concerns are addressed. The Air Force will retain easements in order to perform operations and maintenance on all remediation systems. Funding for restoration activities at closure



EXPLANATION

IRP Sites

Base Boundary

IRP Sites
(as of November 1993)

Site No.	Site Name
FT-002	North Burn Pit
SS-003	Oil Saturated Area
SS-004	Hazardous Waste Drum Storage
ST-005	POL Storage Yard
SS-006	Hazardous Material Storage
ST-007	Leaking Underground Storage Tanks
SS-008	Test Cell Area
SS-009	Fire Valve Area

0 500 1000 2000 Feet

Installation Restoration Program Sites

Figure 3.3-2

Table 3.3-2. Installation Restoration Program Sites
Page 1 of 2

Site	Site Name (Location)	Status	Waste Description
FT-002	North Burn Pit (Fire Training Area)	RI/FS	Built in 1965; concrete berm, lining, and drain added in 1969. Waste oils, solvents, and JP-4 burned from 1965 to 1969; contaminated JP-4 only burned from 1969 to 1988. Low levels of contaminants detected in soil. A 1992 RI showed no groundwater contamination. Under review by Base Realignment and Closure (BRAC) Cleanup Team.
SS-003	Oil Saturated Area (South Cantonment Area)	IRA completed DD	Less than 1 acre. Used for storage of waste POL products from 1955 to 1980. Surface soil contaminated with lead and petroleum hydrocarbons. In a 1991-1992 IRA, 42 cubic yards of contaminated soil were removed. Subsequent testing showed contaminant levels below MDNR cleanup goals. An NFAP DD was submitted to the MDNR and U.S. EPA in December 1992.
SS-004	Hazardous Waste Drum Storage (Central Cantonment Area)	IRA completed DD	Used prior to 1985 to store drums of hazardous waste before removal off base. Subsurface soils showed elevated levels of total petroleum hydrocarbons. In 1991, 15 cubic yards of contaminated soil were removed and subsequent sampling showed subsurface soil contaminant levels below MDNR cleanup goals. An NFAP DD was submitted to MDNR and U.S. EPA in March 1993.
ST-005	POL Storage Yard (Northeast Cantonment Area)	RD/RA	Petroleum products stored in aboveground storage tanks. Known fuel spills and suspected cracking of the containment berm and bottom. Soil samples showed elevated levels of total petroleum hydrocarbons, but little migration off site or into groundwater. Future plans include long-term remedial action including remedial design, construction, and operation for undetermined time. Remedial method is to be determined. Land farming of affected soil is in progress.

Note: Site descriptions and status are current as of November 1993.
DD = Decision Document.
EPA = Environmental Protection Agency.
FS = feasibility study.
IRA = interim remedial action.
JP-4 = jet propulsion fuel, grade 4.
MDNR = Missouri Department of Natural Resources.
NFAP = No Further Action Planned.
POL = petroleum, oil, and lubricants.
RA = remedial action.
RD = remedial design.
RI = remedial investigation.

Table 3.3-2. Installation Restoration Program Sites
Page 2 of 2

Site	Site Name (Location)	Status	Waste Description
SS-006	Hazardous Material Storage(Cantonment Area, off Hangar Road)	PA/SI completed IRA completed	Site served as propeller and engine maintenance shop since 1957. Degreasers, oils, solvents, and lubricants were used and stored on site. Polycyclic aromatic hydrocarbons were detected in soils at significant levels in a 1988 PA. Results of a 1991 SI indicated that contamination is localized in southern portion of site. An IRA to remove 46 cubic yards of contaminated soil was conducted in summer 1993; PA/SI report has been completed.
ST-007	Leaking Underground Storage Tanks (Southern end of Air Force flightline)	DD	Four USTs installed in 1954 and used to store JP-4 until 1971. Abandoned in place in 1977 by filling with water. In 1988 tanks were removed and a passive venting system was installed as an IRA for contaminated soil. Soil and groundwater samples taken in 1990 showed low levels of hydrocarbon contamination below regulatory standards. An NFAP DD was submitted to the MDNR and U.S. EPA in 1992.
SS-008	Test Cell Area (Cantonment Area, northeast portion of aircraft apron)	PA/SI	Used from 1956 to 1977 as aircraft maintenance and wash area. A petroleum odor and oil sheen were noted during waterline excavations in 1991. An SI was conducted in summer 1993.
SS-009	Fire Valve Area (Central Cantonment Area)	PA/SI	Hydrocarbon staining and odors noted during a 1992 excavation for fire hydrant repair. Source of contamination is unconfirmed. Further investigation is planned.

Note: Site descriptions and status current as of November 1993.
DD = Decision Document.
EPA = Environmental Protection Agency.
IRA = interim remedial action.
JP-4 = jet propulsion fuel, grade 4.
MDNR = Missouri Department of Natural Resources.
NFAP = No Further Action Planned.
PA = preliminary assessment.
SI = site inspection.
UST = underground storage tank.

installations was authorized by Congress in 1991 specifically for that purpose. It is anticipated that future authorization acts will continue to fund environmental restoration activities at closing installations.

Prior to the transfer of any property at Richards-Gebaur AFB, the Air Force must comply with the provisions of CERCLA 120(h). CERCLA 120(h) requires that before property can be transferred from federal ownership, the United States must provide notice of specific hazardous substance activities and conditions on the property and, when there have been any such hazardous substance activities, include in the deed a covenant warranting that all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property has been taken before the date of such transfer. Furthermore, for all governmental property transfers by deed, a covenant must also warrant that any additional remedial action associated with past military operations found to be necessary after the date of such transfer shall be conducted by the United States.

The Air Force must complete the CERCLA process for the contaminated sites on Richards-Gebaur AFB and provide the assurances required by CERCLA 120(h) for all properties transferred. The combination of these requirements may delay parcel disposition or conveyance and affect reuse.

The Air Force is committed to the identification, assessment, and remediation of the contamination from hazardous substances at Richards-Gebaur AFB. This commitment will assure the protection of the public health as well as restoration of the environment. Additionally, the Air Force will work aggressively with the regulatory community to ensure that parcel disposition or conveyance occurs at the earliest possible date so as not to impede the economic redevelopment of the area through reuse of Richards-Gebaur AFB. Quantification of those delays based on the conceptual plans for all redevelopment alternatives and what is currently known at this stage of the IRP is not possible.

3.3.4 Storage Tanks

USTs are subject to federal regulations within RCRA, 42 U.S.C. 6991, and U.S. EPA implementing regulations 40 CFR 280. These regulations were mandated by the Hazardous and Solid Waste Amendments of 1984.

In Missouri, the MDNR regulates USTs under 10 CSR 20-10, the Clean Water Commission, Underground Storage Tanks Technical Regulations, and 10 CSR 20-12, State Underground Storage Tank Insurance Fund. These chapters apply to all owners and operators of a UST system, and include definitions, notification requirements, system requirements, release detection, reporting, release response/investigation, and closures. The MDNR also publishes an Underground Storage Tank Closure Guidance Document which outlines and explains pertinent details of UST closures.

Aboveground storage tanks (ASTs) are managed under the Uniform Fire Code, the National Fire Protection Association, and the state Fire Marshal regulations. The base fire department enforces these regulations on base.

Preclosure Reference. Richards-Gebaur AFB has operated 33 USTs (Table 3.3-3). Only two USTs, both at Building 962, remain active; they are scheduled to be removed according to MDNR UST closure guidelines prior to disposal. The status of one UST at Building 903 is unknown; the remaining 30 USTs have been removed (U.S. Air Force, 1993a).

The two hydrant fuel systems consisted of steel lines extending from the POL Storage Yard to the flightline. One system transported aviation gasoline and later jet propulsion fuel, grade 4 (JP-4) from a now inactive pumphouse (on property now owned by Kansas City) to Facility 941, a truck fuel stand approximately 1,200 feet away. This system began operating in 1954, and has been inactive for an unknown period of time. The second system, constructed in 1954, transported JP-4 fuel through approximately 3,400 feet of pipe from Facility 953 to Facility 902, which provided fuel to six fuel pits on the flightline. This system was deactivated in 1971 and demolished in 1988, and the fuel pits were paved over with concrete. At that time, four 25,000-gallon USTs were removed and contamination was identified. Facility 902 is being investigated under the IRP as Site ST-007. The pipelines for both hydrant systems are currently being investigated to determine if there have been any leaks or subsurface contamination.

Thirty-six ASTs have been identified at Richards-Gebaur AFB (Table 3.3-4), of which 18 are active. JP-4 is delivered by tanker truck to two bulk storage ASTs at the POL Storage Yard, with capacities of 187,000 and 210,000 gallons. These tanks have been tested annually since 1989 and no leaks have been identified. The base vehicle fuel station has two 10,000-gallon ASTs, which hold MOGAS and diesel fuel. The four tanks at Facilities 700, 701, 955, and 957 are maintained by the Liquid Fuels Maintenance Group. A 260,000-gallon heating oil tank at the POL storage yard has been abandoned. The other 14 active ASTs are maintained by Intelcom Support Services, Inc. under contract to the Base Civil Engineer. Twelve of these tanks hold MOGAS or diesel for use in power generation and heating, one holds reclaimed JP-4, and the other holds solvent.

OWSs are flow-through systems designed to separate fuel, oil, and grease from water. Other contaminants potentially present in water discharged to an OWS, such as solvents, cannot be removed by this process. Water from an OWS is typically discharged into an industrial sanitary sewer system. At Richards-Gebaur AFB, 33 OWSs have been operated (Table 3.3-5). All active systems are being replaced with aboveground, vaulted OWSs that will be regulated as ASTs under the Clean Water Act (33 U.S.C. §§1251-1387). Underground OWSs are regulated as USTs in Missouri and will be removed by the base in accordance with MDNR guidelines for UST closure.

Table 3.3-3. Underground Storage Tanks

Facility	Contents	Capacity (gallons)	Status	Years of Operation
105	Diesel	250	Removed	1954-1988
602	Diesel	1,000	Removed	1954-1988
620	Waste acid	550	Removed	1966-1988
702	Gasoline	10,000	Removed	1954-1989
702	Gasoline	10,000	Removed	1954-1989
711	JP-4	5,000	Removed	1965-1989
828	Fuel oil	1,500	Removed	1955-1981
828	Fuel oil	1,650	Removed	1981-1992
839	Fuel oil	4,000	Removed	1961-1992
902	JP-4	25,000	Removed	1954-1988
902	JP-4	25,000	Removed	1954-1988
902	JP-4	25,000	Removed	1954-1988
902	JP-4	25,000	Removed	1954-1988
903	Diesel	250	Unknown	1961-Unknown
927	Waste solvent	500	Removed	1989-1993
938	Gasoline	100	Removed	1954-1985
942	Fuel oil #2	15,000	Removed	1955-1988
942	Fuel oil #2	15,000	Removed	1955-1988
947	Stoddard solvent	6,000	Removed	1958-1989
948	Waste oil	500	Removed	1963-1988
948	Fuel oil #2	6,000	Removed	1963-1988
958	Fuel oil #2	250	Removed	1963-1988
962	JP-4	4,000	Active	1984-Present
962	Gasoline	4,000	Active	1984-Present
965	Waste oil	12,000	Removed	1966-1988
1025	Fuel oil #2	550	Removed	1953-1968
1025	Fuel oil #2	1,000	Removed	1968-1988
1025	Diesel	275	Removed	1953-1988
1100	Gasoline	250	Removed	1953-1988
1100	Fuel oil #2	550	Removed	1953-1988
1201	Fuel oil #2	3,000	Removed	1961-1992
1202	Fuel oil #2	1,500	Removed	1959-1982
1202	Fuel oil #2	1,650	Removed	1982-1992

Sources: Burns and McDonnell, 1992; CH_2M Hill, 1983; Environmental Protection Inspection and Consulting, Inc., 1991; Environmental Risk Information and Imaging Services, 1992; MDNR, 1993a; U.S. Air Force, 1992b, 1993b; U.S. Air Force SPTG-CEG, 1993.

Table 3.3-4. Aboveground Storage Tanks

Facility	Contents	Capacity (gallons)	Status	Years of Operation
105	Diesel	275	Active	1972-Present
602 interior	Diesel	90	Active	Unknown-Present
602 exterior	Diesel	275	Active	Unknown-Present
614	Diesel	90	Removed	Unknown
614	MOGAS	50	Removed	Unknown
614	MOGAS	50	Removed	Unknown
614	Diesel	44	Removed	Unknown
700	MOGAS	10,000	Active	1989-Present
701	Diesel	10,000	Active	1989-Present
710	Diesel	275	Active	Unknown-Present
711	Reclaimed JP-4	1,000	Active	Unknown-Present
841	Diesel	275	Active	1970-Present
901	Diesel	275	Active	1970-Present
918	MOGAS	20	Active	Unknown
921	Diesel	1,000	Removed	1956-Unknown
944	JP-4	2,500	Removed	1956-Unknown
945	JP-4	500	Removed	1957-Unknown
945	JP-4	500	Removed	1957-Unknown
945	Waste PD-680, paint thinner, POL	1,000	Removed	1957-Unknown
945	Waste PD-680, paint thinner, POL	1,000	Removed	1957-Unknown
953	Diesel	44	Removed	Unknown
954	Heating oil	260,000	Inactive	1954-Unknown
955	JP-4	187,000	Active	1954-Present
957	JP-4	210,000	Active	1956-Present
958	Waste PD-680, paint thinner, POL	500	Removed	Unknown
963	Solvent	500	Active	Unknown-Present
1009	MOGAS	275	Active	Unknown-Present
1011	MOGAS	275	Removed	1962-Unknown
1025 interior	Diesel	90	Active	1972-Present
1025 exterior	Diesel	275	Active	1972-Present
1025 exterior	Diesel	560	Active	1972-Present
1033	Waste JP-4	5,000	Removed	1961-Unknown
1100	MOGAS	275	Active	Unknown-Present
1401	MOGAS	275	Removed	Unknown
9610	Diesel	10,000	Inactive	1958-Unknown
9610	MOGAS	10,000	Inactive	1958-Unknown

exterior = AST is found outside facility.
interior = AST is found inside facility.
JP-4 = jet propulsion fuel, grade 4.
MOGAS = motor gasoline.
POL = petroleum, oil, and lubricants.

Sources: CH_2M Hill, 1983; Intelcom Support Services, 1992; U.S. Air Force, 1993a.

Table 3.3-5. Oil/Water Separator Systems

Facility	Capacity (gallons)	Status	Years of Operation	Type of System	Regulatory Status
702	50	Removed	1989-1993	A	CWA
702	190	Removed	1989-1993	U	MDNR
702	550	Active	1993-Present	A	CWA
702	550	Active	1993-Present	A	CWA
704	500	Removed	1956-1989	U	MDNR
704	500	Removed	1956-1975	U	MDNR
704	500	Removed	1975-1993	U	MDNR
704	282	Removed	1989-1993	U	MDNR
704	550	Active	1993-Present	A	CWA
704	550	Active	1993-Present	A	CWA
711	1,000	Removed	1965-1993	U	MDNR
711	500	Removed	1965-1993	U	MDNR
711	282	Removed	1989-1993	U	MDNR
711	550	Active	1993-Present	A	CWA
711	550	Active	1993-Present	A	CWA
920	200	Removed	1973-1993	U	MDNR
920	500	Removed	1973-1993	U	MDNR
920	550	Active	1993-Present	A	CWA
920	550	Active	1993-Present	A	CWA
927	400	Closed in place	1958-1989	U	MDNR
927	100	Closed in place	1958-1989	U	MDNR
940	275	Removed	1965-1988	U	MDNR
940	1,075	Removed	1965-Unknown	U	MDNR
944	1,000	Removed	1956-1988	U	MDNR
944	140	Removed	1956-1988	U	MDNR
1033	425	Closed in place	1972-1989	U	MDNR
1033	565	Removed	1972-1989	U	MDNR
9470	7,800	Removed	1973-1989	A	CWA
9470	1,000	Active	1973-Present	U	MDNR
9470	1,500	Removed	1973-1989	U	MDNR
9470	282	Removed	1989-1993	U	MDNR
9470	550	Active	1993-Present	A	CWA
9470	550	Active	1993-Present	A	CWA

A = aboveground storage.
CWA = Clean Water Act program.
MDNR = Missouri Department of Natural Resources.
U = underground storage.

Closure Baseline. The base plans to remove all USTs prior to closure. ASTs are to be closed in accordance with the state Fire Marshal's standard. Underground OWSs will be removed in accordance with MDNR guidelines for USTs. Aboveground OWSs will be pumped and cleaned of any residual materials prior to base closure. Based on the results of the hydrant fuel line study, further investigation or remedial action may be necessary. The OL will be responsible for maintaining any remaining storage tanks in compliance with applicable federal and state regulations.

3.3.5 Asbestos

Asbestos-containing material (ACM) remediation is regulated by the U.S. EPA and the Occupational Safety and Health Administration (OSHA). Asbestos fiber emissions into the ambient air are regulated in accordance with Section 112 of the Clean Air Act, which established the National Emissions Standards for Hazardous Air Pollutants (NESHAP). The NESHAP regulations address the demolition or renovation of buildings with ACM. The Toxic Substances Control Act (TSCA) (15 U.S.C. §§2601, et seq.) and the Asbestos Hazard Emergency Response Act (AHERA) (P.L. 99-519 and P.L. 101-637) provide the regulatory basis for handling ACM in kindergarten through 12th grade school buildings. AHERA and OSHA regulations cover worker protection for employees who work around or remediate ACM. The state of Missouri regulates asbestos under Division 10, the Air Conservation Commission (10 CSR 10) and is in the process of promulgating additional definitions.

Renovation or demolition of buildings with ACM has a potential for releasing asbestos fibers into the environment. Asbestos fibers could be released due to disturbance or damage, from various building materials, such as pipe and boiler insulation, acoustical ceilings, sprayed-on fire proofing, and other material used for sound proofing or insulation.

There are two primary categories that describe ACM. Friable ACM is defined as any material containing more than 1 percent asbestos (as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, polarized light microscopy) that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. Nonfriable ACM are those materials that contain more than 1 percent asbestos, but do not meet the rest of the criteria for friable ACM.

Preclosure Reference. The current Air Force practice is to manage or abate (encapsulate or remove) ACM in active facilities and remove ACM, following regulatory requirements, prior to facility demolition. Removal of ACM occurs when there is a potential for asbestos fiber release that would affect the environment or human health. The Air Force policy concerning the management of asbestos for base closures can be found in Appendix G.

A basewide survey for ACM was conducted at Richards-Gebaur AFB in 1987 in accordance with FPMR disclosure requirements prior to property disposal. All 71 buildings on base property at that time were inspected, and friable and non-friable materials suspected of containing asbestos were assessed. Of the 71 buildings inspected, 39 had ACM and 32 either had no suspected material found or all samples taken were negative. All samples of the steam piping system tested negative for ACM. The buildings surveyed and status of ACM identified are presented in Appendix G.

Since 1987, ten facilities have been built on Richards-Gebaur AFB. These facilities have not been surveyed for asbestos. No survey is planned but, given the recent date of construction, ACM is not expected to be present.

The Base Environmental Engineer is responsible for managing asbestos in accordance with all applicable regulations and Air Force policy. The Asbestos Management Plan (1991) provides guidance for ACM management and removal. One building on base, a Heating Facility, has been closed to access due to the condition of ACM in the building.

Closure Baseline. Asbestos will be managed as necessary to protect human health. Beyond that, an analysis will be conducted to determine the cost effectiveness of removing ACM versus the impacts of ACM on the market value of the property, when sale of the property is planned. ACM will be removed if a building is, or is intended to be, used as a school or child care facility. Exposed friable asbestos will be abated in accordance with applicable Air Force policy (Appendix G) and health laws, regulations, and standards, if it is determined that a health hazard exists. ACM management after closure will be the responsibility of the OL.

3.3.6 Pesticide Usage

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. §§136-136y) regulates the registration and use of pesticides. Pesticide management activities are subject to federal regulations contained in 40 CFR parts 162, 165, 166, 170, and 171. The state of Missouri requires that commercial applicators of pesticides obtain a license through the Department of Agriculture under State Statute 281, the Missouri Pesticide Act. Rules and regulations of pesticide use and management are found in 2 CSR 70-25. These rules and regulations provide definitions and requirements for pesticide use and storage as well as for the operations and permitting requirements for commercial applicators.

Preclosure Reference. Pesticide control at Richards-Gebaur AFB is accomplished by a commercial pest control company under contract to the Base Civil Engineer. No bulk pesticides are stored or mixed on site, nor is any equipment cleaned at Richards-Gebaur AFB. Household pests are controlled by spraying buildings with the synthetic insecticides Dursban Lo,

Orthene, and Commadore. Wood-destroying insects (termites) are controlled by applying the insecticide Demon in the soil surrounding each facility at depths of 12 to 14 inches. All of the applied pesticides are synthetic chemicals designed to be short lived in the environment. Rodent control is also accomplished by the contractor as needed with the use of Talon G, a rodenticide.

In the past, commonly used pesticides included Diazinon, Malathion, Chlordane, Dursban, Pyrethion, Diazinon Dust, Warfarin, Sevin, and Vapona (U.S. Air Force, 1983). They were stored in a building that is not part of the current Richards-Gebaur AFB, and their use was controlled by the Entomology Detachment of what was then the Civil Engineering Squadron.

Herbicides are applied by a contractor from April through October. Herbicides typically applied are 2,4D, Krovar, Dipel, Weed-Be-Gone, Torton 10K pellets, Round-Up, and Emark 25 (CH_2M Hill, 1983).

Closure Baseline. At closure, pesticides will continue to be used for pest management purposes. The OL will be responsible for managing the contractor application of pesticides and ensuring that application and licensing are done according to federal and state regulations.

3.3.7 Polychlorinated Biphenyls

Commercial PCBs are industrial compounds produced by the chlorination of biphenyls. PCBs persist in the environment, accumulate in organisms, and concentrate in the food chain. PCBs are used in electrical equipment, primarily in capacitors and transformers, because they are electrically nonconductive and stable at high temperatures.

The disposal of these compounds is regulated under TSCA, which banned the manufacture and distribution of PCBs, with the exception of PCBs used in enclosed systems. By federal definition, PCB equipment contains 500 parts per million (ppm) PCBs or more, whereas PCB-contaminated equipment contains PCB concentrations of 50 ppm or greater, but less than 500 ppm. The U.S. EPA, under TSCA, regulates the removal and disposal of all sources of PCBs containing 50 ppm or more; the regulations are more stringent for PCB equipment than for PCB-contaminated equipment.

The state of Missouri regulates PCBs under 10 CSR 25-13.010, which establishes standards for the management of waste materials or waste manufactured items containing PCBs at concentrations of 50 ppm or more.

At Richards-Gebaur AFB, PCBs are managed by the Base Environmental Engineer in accordance with guidelines provided in the PCB Plan, prepared by the Base Civil Engineer.

Preclosure Reference. No Air Force-owned PCB or PCB-contaminated transformers remain on Richards-Gebaur AFB. In 1990 all transformers were tested and those with PCBs above 50 ppm were retrofilled with non-PCB fluid to bring PCB concentrations under 50 ppm; and U.S. EPA, Region VII, issued a Notice of Compliance to that effect on October 21, 1993. MPS operates a number of transformers on base property and reports that all have PCB concentrations below 50 ppm.

Closure Baseline. No federally or state regulated PCB or PCB-contaminated equipment under the control of the Air Force will be left on the base at closure.

3.3.8 Radon

Radon is a naturally occurring, colorless and odorless radioactive gas that is produced by radioactive decay of naturally occurring uranium. Uranium decays to radium, of which radon gas is a by-product. Radon is found in high concentration in rocks containing uranium, such as granite, shale, phosphate, and pitchblende. Atmospheric radon is diluted to insignificant concentrations. Radon that is present in soil, however, can enter a building through small spaces and openings, accumulating in enclosed areas, such as basements. The cancer risk caused by exposure through the inhalation of radon is currently a topic of concern.

There are no federal or state standards regulating radon exposure at the present time. The U.S. EPA offers a pamphlet, "A Citizen's Guide to Radon" (U.S. EPA, 1992), which offers advice to persons concerned about radon in their homes. U.S. Air Force policy requires implementation of the Air Force Radon Assessment and Mitigation Program (RAMP) to determine levels of exposure of military personnel and their dependents. The RAMP is designed to study family housing and schools on U.S. Air Force property. The EPA has made testing recommendations for both residential structures and schools. For residential structures, using a 2- to 7-day charcoal canister test, a level between 4 and 20 picocuries per liter (pCi/l) should lead to additional screening within a few years. For levels of 20 to 200 pCi/l, additional confirmation sampling should be accomplished within a few months. If the level is in excess of 200 pCi/l, the structure should be evacuated immediately. Schools are to use a 2-day charcoal canister test; if readings are 4 to 20 pCi/l, a 9-month school year survey is required. If levels are below 4 pCi/l, no further action is recommended. Table 3.3-6 summarizes the recommended radon surveys and action levels.

Preclosure Reference. The Air Force RAMP policy requires a detailed radon assessment program for levels of 4 pCi/l or greater found in family housing or schools. Because there are no family housing units or schools at Richards-Gebaur AFB, no RAMP was conducted. Results of a 1988 study (Missouri Department of Health, 1988) showed that more than 80 percent

Table 3.3-6. Recommended Radon Surveys and Mitigations

Facility	U.S. EPA Action Level[a]	Recommendation
Residential	4 to 20 pCi/l	Additional screening. Expose detector for 1 year. Reduce radon levels within 3 years if confirmed high readings exist.
Residential	20 to 200 pCi/l	Perform follow-up measurements. Expose detectors for no more than 6 months.
Residential	Above 200 pCi/l	Follow-up measurements. Expose detectors for no more than one week. Immediately reduce radon levels.
	Two-Day Weekend Measurement	
School	4 to 20 pCi/l	Confirmatory 9-month survey. Alpha track or ion chamber survey.
School	Greater than 20 pCi/l	Diagnostic survey or mitigation.

Notes: Congress has set a national goal for indoor radon concentration equal to the outdoor ambient levels of 0.2 to 0.7 pCi/l.
(a) For levels below 4 pCi/l, no further action is recommended.
pCi/l = picocuries per liter.
EPA = Environmental Protection Agency.

Source: U.S. EPA, 1992b.

of samples in Cass County and more than 60 percent in Jackson County had radon levels below 4 pCi/l; one percent of the Jackson County samples were above 20 pCi/l; the remainder of the samples had radon levels between 4 and 20 pCi/l.

Closure Baseline. No radon studies are planned on Richards-Gebaur AFB.

3.3.9 Medical/Biohazardous Waste

Current federal regulations do not provide for regulation of medical wastes, but do allow for states to individually regulate medical wastes. The state of Missouri regulates medical waste under 10 CSR 80-7, Solid Waste Management, Infectious Waste. This chapter defines infectious waste and provides a framework for disposal and management of infectious wastes. The regulations are administered by MDNR and local health agencies.

Preclosure Reference. Richards-Gebaur AFB operates a medical clinic used for deployment training (setting up a field hospital) and providing physicals for Reserve personnel; no in-patient services are provided. The base generates medical wastes below the MDNR threshold amount of 100 kilograms per month, and therefore qualifies as a small quantity

generator. Small-quantity generators are exempt from the transportation and fee requirements of 10 CSR 80-7. A permitted contractor removes medical wastes from the medical center once a month for proper disposal off base. The Bioenvironmental Engineering Technician is responsible for monitoring medical wastes on base.

Closure Baseline. At the time of base closure the medical clinic will be inactive and no medical wastes will be generated. Existing medical wastes will have been properly disposed.

3.3.10 Ordnance

Richards-Gebaur AFB operates a Weapons Bunker. The base does not currently operate nor has it in the past operated an explosive ordnance disposal range. There is an active small arms firing range on base.

Preclosure Reference. The Weapons Bunker occupies 8 acres and is surrounded by a 106-acre safety easement. The Weapons Bunker contains an office, a workshop, and an ordnance storage magazine. Various types of ordnance associated with the A-10 Thunderbolt II aircraft are stored, including 30-mm cannon shells (approximately 100,000 rounds) and motors for air-to-ground rockets. Old or off-specification ordnance is picked up and transported off base for disposal in coordination with McConnel AFB, Kansas.

The Small Arms Range occupies 2 acres northeast of the Cantonment Area; a 20-acre safety easement is adjacent to the range. The range was constructed in 1956, and is still used by Richards-Gebaur AFB personnel and other government agencies. Sample taken at the Small Arms Range in August 1993 showed that concentrations of lead present in the soils inside the firing range, although greater than background levels, are below regulatory action levels and no remedial action is required (Burns and McDonnell, 1993).

Closure Baseline. At the time of base closure, all remaining ordnance will have been removed from the Weapons Bunker according to applicable federal, state, and local regulations.

3.3.11 Lead-Based Paint

Human exposure to lead has been determined to be an adverse health risk by agencies such as OSHA and U.S. EPA. Sources of exposure to lead are through dust, soils, and paint. Wastes containing levels of lead exceeding a maximum concentration of 5.0 milligrams per liter (as measured using the Toxicity Characteristics Leaching Procedure) are defined as hazardous under 40 CFR 261 and Missouri 10 CSR 25. If a waste is classified as hazardous,

disposal must take place in accordance with U.S. EPA and Missouri hazardous wastes rules.

In 1973, the Consumer Product Safety Commission (CPSC) established a maximum lead content in paint of 0.5 percent by weight in a dry film of newly applied paint; in 1978, under the Consumer Product Safety Act (P.L. 101-608, as implemented by 16 CFR 1303) the CPSC lowered the allowable lead level in paint to 0.06 percent. The act also restricted the use of lead-based paints in nonindustrial facilities. In 1989, U.S. EPA established a cleanup criterion for lead in soil of 500 to 1,000 ppm total lead based on the characteristics of individual sites when the possibility of child contact exists. The Lead-Based Paint Poisoning Prevention Act (LBPPPA) (42 U.S.C. 4822[a]) and Subtitle A of the Residential Lead-Based Paint Hazard Reduction Act of 1992 (which amends the LBPPPA) regulate the use and management of lead-based paints in federal housing facilities. In 1993, the federal OSHA, under 29 CFR 1926, extended the permissible exposure limit for general industrial workers of 50 micrograms per cubic meter of air to include workers in the construction field.

To ensure that any threat to human health and the environment from lead-based paints has been identified, Air Force policy requires that a lead-based paint survey of high-priority facilities be conducted at Air Force installations. High-priority facilities consist of military family housing, transient lodging facilities, schools and other facilities frequented by children, including day care facilities and recreational areas. There are no high-priority facilities at Richards-Gebaur AFB.

Preclosure Reference. The primary focus of the concerns surrounding lead-based paint are in housing situations and other high-priority facilities where children may be exposed. No study to assess the presence of lead-based paint or its associated soil contamination on base has been performed on Richards-Gebaur AFB because there are no high-priority facilities. The guideline used by the U.S. Department of Housing and Urban Development (HUD) is to issue written notification to buyers of HUD homes built prior to 1978 of the possible presence of lead-based paint and its associated hazards.

Closure Baseline. No studies to assess the presence of lead-based paint are planned at this time.

3.4 NATURAL ENVIRONMENT

This section describes the affected environment for natural resources: geology and soils, water resources, air quality, noise, biological resources, and cultural resources.

3.4.1 Geology and Soils

The ROI for geology is the regional setting to provide context as well as specific features on base; the ROI for soils is the base.

3.4.1.1 Geology

Physiography. Richards-Gebaur AFB is located within the Osage Plains physiographic province, in the North American Central Lowlands. The terrain in the ROI is characterized by a nearly level plain that has been incised by tributaries of the Missouri River, resulting in gently to steeply rolling hills, with relative relief generally around 50 feet, but locally occurring up to about 150 feet. The Cantonment Area and the smaller parcels surrounding it are located on a low ridge that divides the Blue River drainage system (west of the base) from the Little Blue River system (east of the base). The Belton Training Complex is in rolling terrain incised by the secondary drainages of the West Fork of East Creek. Elevations range from about 1,000 feet above MSL to about 1,100 feet above MSL in the various areas of the base.

Geology. The general geology of the area is characterized by thick sequences of gently folded sedimentary rocks of the Paleozoic Era, locally overlain by Pleistocene wind-deposited sediments, associated with glacial activity north of the ROI.

The two major surface geologic units on Richards-Gebaur AFB are thin (maximum of a few feet) deposits of wind-blown silt (loess) deposited on bedrock and residuum. Residuum is unconsolidated material formed from the surface layer of bedrock. The surface bedrock has been weathered and broken down in places, forming a layer of varying thickness containing clay, silt, sand, and larger rock fragments on top of unweathered bedrock.

Depth to bedrock ranges from immediately below the surface to about 20 feet. Near-surface bedrock on Richards-Gebaur AFB (including the Belton Training Complex) includes one or more of the Iola, Lane, and Wyandotte formations (Missourian Series of the Pennsylvanian System). Predominant units identified in soil borings on the base and adjacent to the airfield are the Argentine Member of the Wyandotte Formation, the Lane Formation, and the Raytown Member of the Iola Formation. Lithologies in these formations include fossiliferous limestones, shales, interbedded limestones and shales, limestones with nodular chert, ribbon (very thinly bedded) limestones, and lesser amounts of siltstones and sandstones. Approximately 2,500 feet of Pennsylvanian and older sediments underlie the base (Gentile, 1984).

Structurally, the Paleozoic sedimentary units are gently folded into a series of north-south trending synclines, anticlines, domes, and basins. The

runway is approximately aligned along the axis of the Jost Syncline. The Cantonment Area is on the eastern limb of the syncline, which is also the northeastern side of King Dome (a structural high immediately east of the Jost Syncline). Other parcels are scattered on the northern, western, and southern flanks of the dome; the Billeting Complex is located near the dome's crest. The Belton Training Complex is located on a slight anticlinal form between the Jaudon Anticline (to the west) and the Main City-Belton Syncline (to the east) (Gentile, 1984).

A major structural feature in the vicinity is the Belton Ring-Fault Complex, located south of the Weapons Bunker and north of the Belton Training Complex. The Belton Ring-Fault Complex is a circular area of several square miles in which the rocks have been down-faulted approximately 150 feet relative to the surrounding rock. The structure appears to have been formed by collapse into caverns formed in Mississippian-age limestones (Gentile, 1984). Erosion and soil development have had sufficient time to remove or conceal fault scarps, deep depressions, etc., indicating that the collapse was not recent, although the specific age of this event has not been determined.

Mineral Resources

Oil and Gas. The region around Richards-Gebaur AFB has been producing oil and natural gas since 1904 (Gentile, 1984). Although the area around Belton and the base has been classified as an "area of lesser potential" for discovery of petroleum resources, several oil or gas pools have been found near the base (Netzler, 1981a, b). Most oil wells produce oil at low rates (Gentile, 1984). The area has not produced commercial amounts of natural gas in many years; however, some Belton residents use gas wells for home heating.

A number of wells were drilled in areas adjacent to base property; some wells were dry, and several contained oil or gas of insufficient quantity and quality for economical production. Therefore, these wells were never developed (Netzler, 1990). Wells (primarily gas tests) have also been drilled within or immediately adjacent to the Belton Training Complex. Two wells had gas shows of insufficient quantity to produce and the remainder were classified as dry (Gentile, 1984; Netzler, 1990).

Coal. The entire area is underlain by several dozen coal beds in Pennsylvanian rocks; however, the beds in this area are too thin or too deep to be economically viable for mining (Gentile, 1984). The amount of available coal in the area represents a small percent of the resources available throughout the state (Robertson, 1984).

Aggregate. The primary sources of sand and gravel aggregate used in construction are alluvium along the numerous river and stream channels in

the area (Rueff, 1984). The alluvium in the Osage Plains is generally fine sand, with little or no gravel. As a result, crushed limestone is routinely used as gravel. Aggregate from the nearby Missouri River floodplains is also available as needed, and the supply is nearly inexhaustible (U.S. Geological Survey and Missouri Division of Geological Survey and Water Resources, 1967). There are no aggregate resources on Richards-Gebaur AFB.

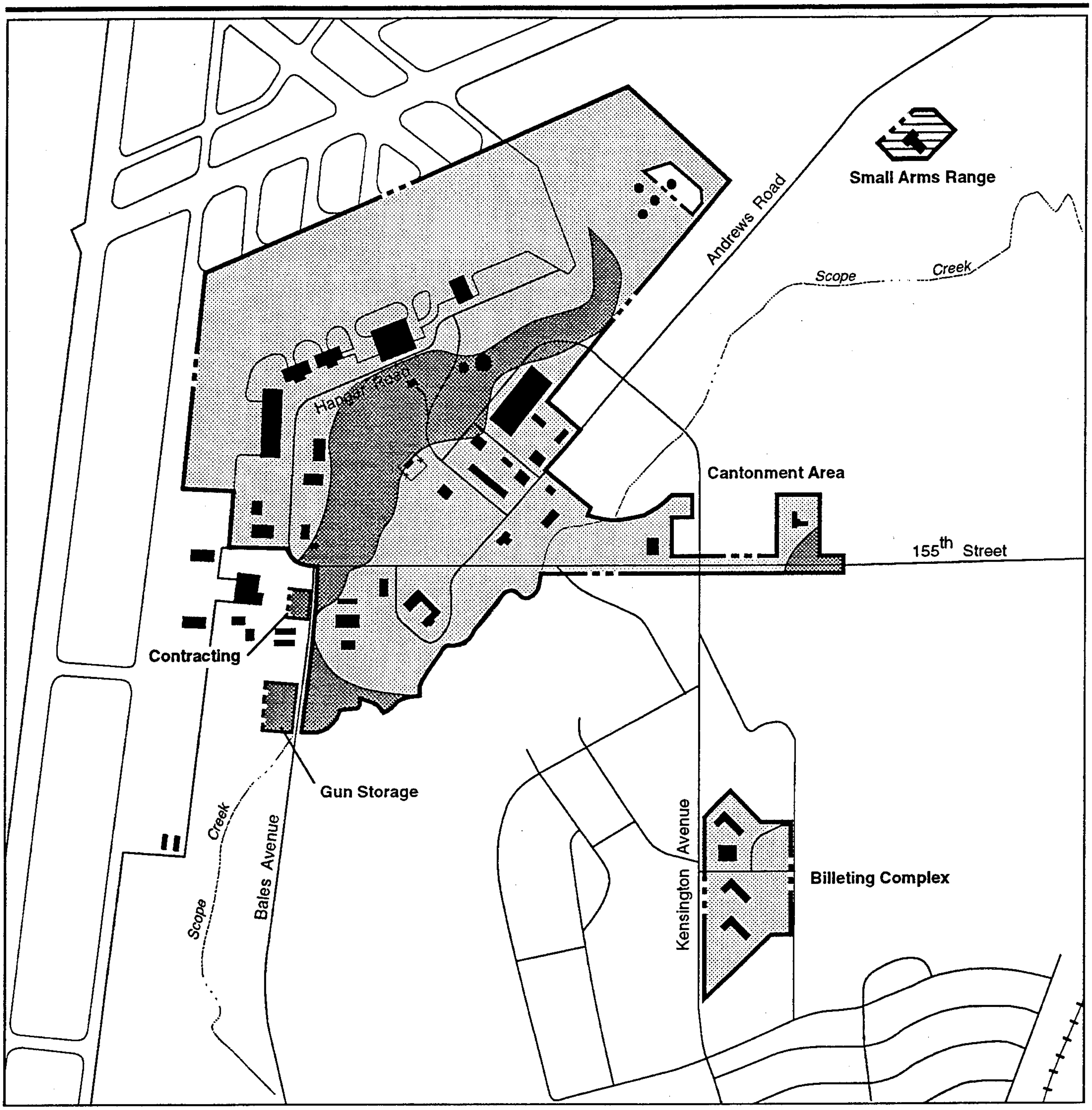
Other. There is some potential for oil-shale resources associated with the coal deposits, but the amount of reserves would be very limited (Nuelle and Sumner, 1981). The limestones in the area have historically been quarried for building stone but, because it is substandard grade, no future quarrying operations are expected (Gentile, 1984; Rueff, 1985; Rueff and Hays, 1985). There are no known economic deposits of metals or other mineral resources in the ROI.

Seismicity. The Richards-Gebaur AFB vicinity is transitional between seismic zones 2B (west of the base) and 1 (east and south of the base), as classified by the Uniform Building Code (International Conference of Building Officials, 1991). Seismic zone 2B has a potential for moderate damage from seismic activity; seismic zone 1 has a potential for minor damage. This classification system is used to consider earthquake stress in developing design requirements for buildings.

Designation of the area as seismic zone 2B is based on the presence of the Nemaha Uplift seismic zone, which extends from Omaha, Nebraska, to Oklahoma (Docekal, 1970), and has historically experienced moderate and small earthquakes. Maximum horizontal acceleration (ground shaking) from a seismic event in the ROI has been projected to be very small (Algermissen et al., 1982).

Other Natural Hazards. As described previously, the immediate vicinity of the base (between the Weapons Bunker and the Belton Training Complex) has experienced a large-scale sinkhole collapse (the Belton Ring-Fault Complex). Although other collapses cannot be ruled out, the elapsed time from the creation of the Belton Ring-Fault Complex indicates that the likelihood of large events is low. Construction projects that include excavation should consider subsurface void spaces, and the possibility of induced ground collapse (Gentile, 1984).

3.4.1.2 Soils. Soils in the ROI are formed on the silt and weathered bedrock surfaces; soil textures are primarily silt loams and silty clay loams (U.S. Department of Agriculture, 1984, 1985). Five soil types have been mapped in the ROI (Figures 3.4-1a and b). Selected soil properties are listed in Table 3.4-1. In general, the common soil properties of wetness, shrink-swell, frost action, and low strength must be considered in construction activities. In particular, the Macksburg silt loam, the Macksburg-Urban Land Complex, and the Nowata Variant silt loam are unsuitable for septic tank



EXPLANATION

Greenton silty clay loam

Macksburg silt loam

Macksburg-Urban Land Complex

Nowata Variant silt loam *

Sharpsburg silt loam *

Base Boundary

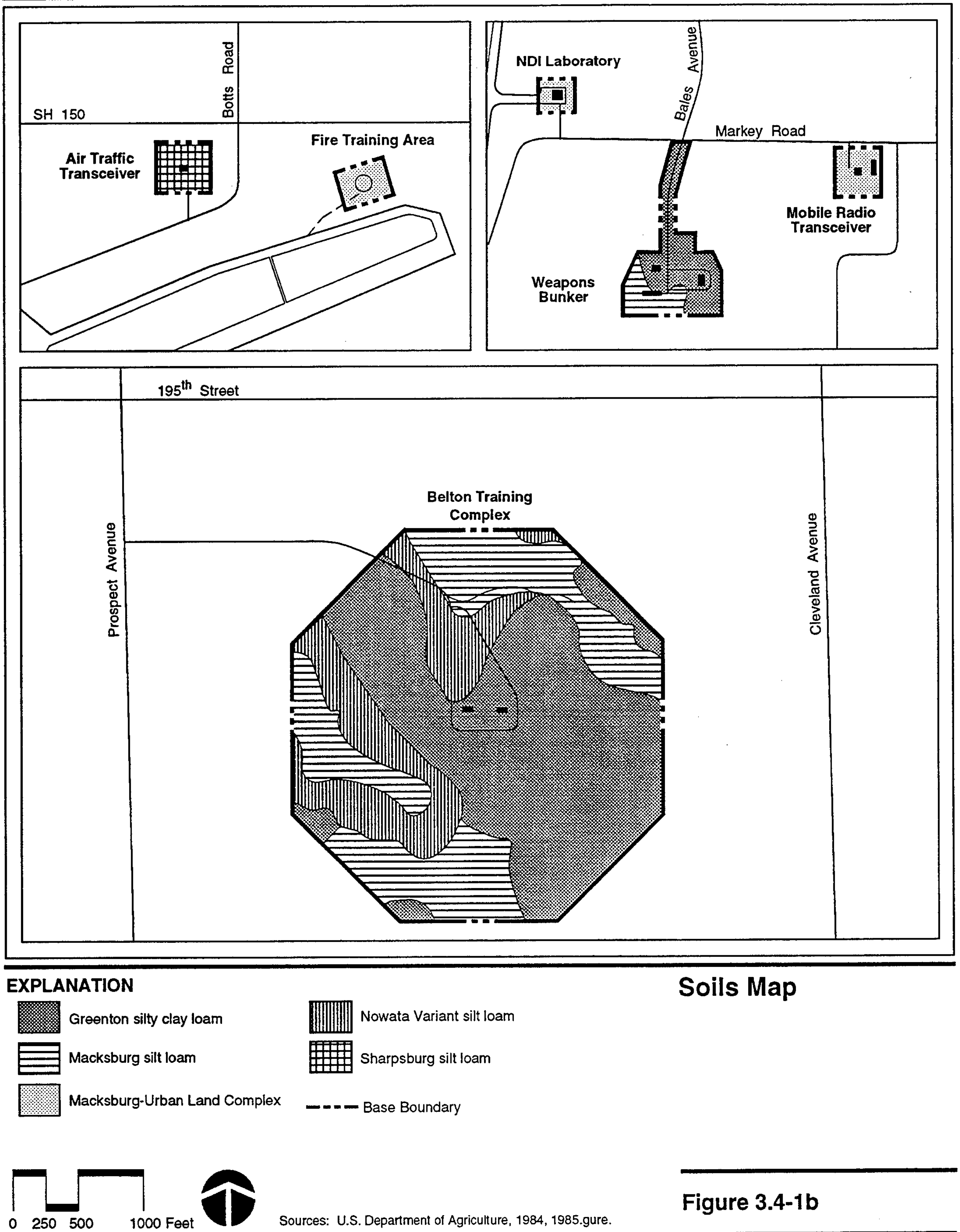
0 250 500 1000 Feet

Sources: U.S. Department of Agriculture, 1984, 1985.

* Standard soil designation not applicable to this figure.

Soils Map

Figure 3.4-1a



Soils Map

Sources: U.S. Department of Agriculture, 1984, 1985.gure.

Figure 3.4-1b

Table 3.4-1. Soils on Richards-Gebaur AFB

Soil Type	Location(s)[a]	Source	Slope (%)	Permeability	Shrink-Swell	Erosion Potential	Infiltration
Greenton silty clay loam	Cantonment Area, Weapons Bunker, Belton Training Complex	Thin loess and residuum (shale)	5-9	Low	Moderate-High	High	Low
Macksburg silt loam	Small Arms Range, NDI Laboratory, Weapons Bunker, Mobile Radio Transceiver, Belton Training Complex	Loess	2-5	Moderately low	Moderate-High	High	Moderate
Macksburg-Urban Land Complex	Cantonment Area, Fire Training Area, Billeting Complex	Loess and Residuum	2-5	Moderate	Moderate-High	High	Moderate
Nowata Variant silt loam	Belton Training Complex	Residuum (Limestone)	5-9	Moderately low	Low-Moderate	High	Moderate
Sharpsburg silt loam	Air Traffic Transceiver	Deep loess	5-9	Moderately low	Moderate	High	Moderate

Note: (a) Distribution of soils is shown on Figures 3.4-1a and b.
NDI = nondestructive inspection.

Sources: U.S. Department of Agriculture, 1984, 1985.

absorption fields and sewage lagoons; other wastewater treatment/disposal methods (such as sewers) are appropriate.

The Macksburg silt loam and the Sharpsburg silt loam have been identified by the Soil Conservation Service as Prime Farmlands. A Farmland Conversion Rating Form (U.S. Department of Agriculture Form AD-1006) for the base area has been prepared in coordination with the Soil Conservation Service and is presented in Appendix K.

Section 3.3.3 discusses the location and extent of contaminated soils on the base.

3.4.2 Water Resources

The ROI for surface water is the watershed areas in which Richards-Gebaur AFB is located. The ROI for groundwater is the local/regional aquifer. There are no coastal areas within the ROI.

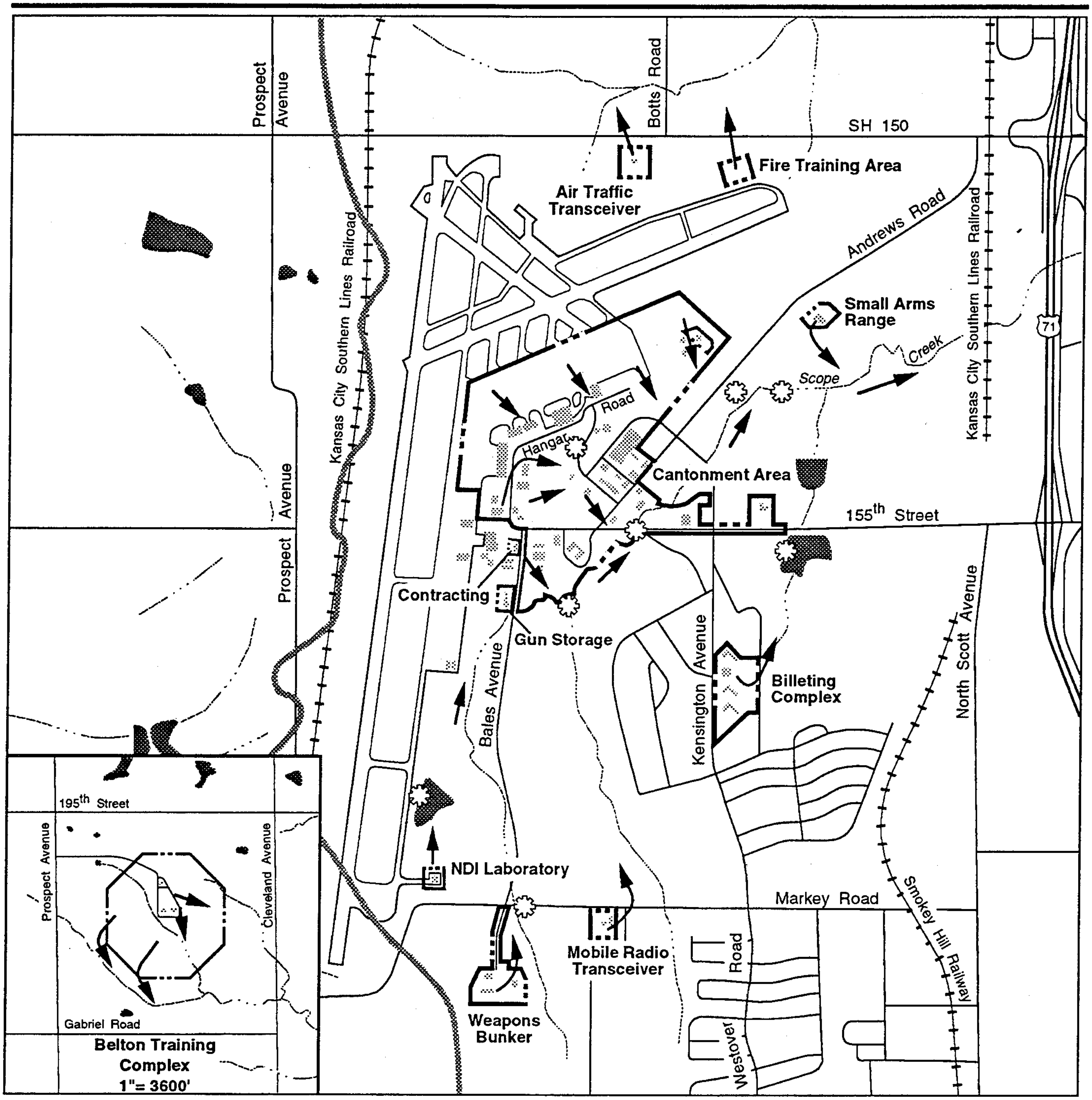
3.4.2.1 Surface Water. The main base area is within the Missouri River drainage basin; the Belton Training Complex is within the South Grand portion of the Osage River drainage basin (MDNR, 1986). The surface hydrology of the base area is shown on Figure 3.4-2.

The local surface hydrology is dominated by the drainage systems of the Blue and Little Blue rivers. Scope Creek, the only natural drainage/surface water feature on the base, flows from the south to the northeast, terminating in the Little Blue River. Scope Creek is an intermittent stream that contains water much of the time. A number of impoundments also have been built in the area, creating numerous ponds. None of the these ponds are on Richards-Gebaur AFB, although two are adjacent to base property (see Figure 3.4-2).

The primary drinking water source for the entire region is the Missouri River. The water is piped from the river by the Kansas City Water and Pollution Control Department (see Section 3.2-4).

There are no mapped 100-year floodplains on Richards-Gebaur AFB (Federal Emergency Management Agency, 1979, 1983, 1986, 1992). There are no natural springs on the base, and there are no major springs in the vicinity (MDNR, 1986).

Surface Water Quality. Human activity along the Missouri River has historically caused a number of water quality problems. Typhoid caused by sewage dumped in the river was a severe problem in the early 1900s. Rising bacterial contamination as well as chemical contamination (e.g., grease and petroleum byproducts, sulfate, mercury) and reduced dissolved oxygen content have been problems since water quality studies were begun



Surface Hydrology

EXPLANATION

- Watershed Divide between Blue River and Little Blue River
- Surface Impoundment
- Water Quality Sampling Location
- Surface Flow Direction (Approximate)
- Intermittent Stream
- Base Boundary

0 500 1000 2000 Feet

Figure 3.4-2

in 1913 (Ford, 1982). Recent federal and state regulations have been enacted to improve the overall water quality and eliminate new water quality issues; the improvements in Missouri River water quality as a result of these regulations are still under study.

The Kansas City Water and Pollution Control Department samples and tests monthly the drinking water that is supplied to Richards-Gebaur AFB. The water is treated after removal from the river (see Section 3.2-4) to reduce the initial content of total dissolved solids (TDS), silica content, calcium content, alkalinity, hardness, and turbidity. This treatment process brings the water within all primary federal and state drinking water standards. The water treatment process raises the pH from approximately 8.3 to 9.7. This exceeds the U.S. EPA secondary standard for pH, which is a guideline range of 6.5 to 8.5, identified as a reasonable goal, rather than as a requirement.

The Air Force samples and tests the water quality at five sites along Scope Creek, one along a runoff-channel up-gradient of Scope Creek, and the two ponds that receive runoff from the Billeting Complex and NDI Laboratory (see Figure 3.4-2). For a number of chemicals, analysis results were below detectable levels (e.g., beryllium, cyanide, ammonia, nitrate, and many others). Water samples that did exceed detectable levels (e.g., chloride, fluoride, phenol, oil, and grease) had low concentrations of measurable contaminants.

3.4.2.2 Wetlands. Wetlands are present on Richards-Gebaur AFB in natural drainages in the Cantonment Area and the Belton Training Complex. Wetlands are discussed in Section 3.4.5.4.

3.4.2.3 Surface Drainage. Drainage flow directions are shown on Figure 3.4-2. With the exception of the Belton Training Complex, drainage from the on-base areas naturally flows toward Scope Creek, which then flows into the Little Blue River. The Little Blue River flows north into the Missouri River. Drainage from the Billeting Complex and the NDI Laboratory flows into two surface water impoundments on Scope Creek tributaries. Drainage flows from the Belton Training Complex southeast into the West Fork of East Creek, which flows into the South Grand River, a source of water for the Harry S. Truman Reservoir (MDNR, 1986).

In September 1992, Richards-Gebaur AFB applied to the MDNR for a National Pollutant Discharge Elimination System (NPDES) permit as a non-point source that discharges into Scope Creek (an unclassified intermittent stream), in compliance with NPDES requirements of the Clean Water Act and Missouri water regulations. Discharges consist primarily of storm water runoff from areas used for industrial and related activities. The application did not include runoff that flows into the two ponds near the base, or any runoff from the Belton Training Complex. The application is under review.

The Little Blue River is listed as a Metropolitan No-Discharge Stream. A No-Discharge Stream is defined as a stream or waterway that shall not receive any discharges other than non-contaminated, non-contact cooling water from power plant facilities and/or agricultural land storm water runoff (MDNR, 1993b). The Truman Reservoir is listed as a Major Reservoir (10 CSR 20) and is classified for levels of water quality protection that allow the water to be suitable for whole-body contact (e.g., swimming).

None of the waterways described are listed as Outstanding National Resource waters or outstanding state resource waters. There are no designated wild and scenic rivers in the ROI.

3.4.2.4 Groundwater. The ROI is within the Osage-Salt Plains groundwater area of the Central Nonglaciated Plains groundwater region (Heath, 1988). The Osage-Salt Plains area is characterized by Pennsylvanian and Mississippian sandstone and limestone aquifers that yield water from shallow wells at low rates; wells deeper than 400 feet yield non-potable mineralized water (MDNR, 1986).

The base does not use any groundwater, and there are no operational water wells on base. Groundwater use in the area is limited to a few individual residences that tap perched aquifers for potable water.

The ROI is not located within a sensitive or special water well construction area (as defined by the state of Missouri), in which geologic conditions would necessitate additional well construction requirements (MDNR, n.d.).

Groundwater Quality. The majority of the available groundwater in the vicinity is non-potable. TDS content in groundwater exceeds 40,000 ppm, far exceeding the U.S. EPA Secondary Drinking Water Standard for TDS of 500 ppm. Fresh water of acceptable quality occurs at shallower depths, but much of the water is only locally available from perched aquifers, or from shallow aquifers where water yields are low because of low permeability. Because the groundwater is generally not used, there are no sole source aquifers in the Richards-Gebaur AFB ROI. Some perched aquifers may be the primary water source for individual residences, but the availability of surface water provides alternative drinking water sources for the area. Groundwater contamination issues on base are discussed in Section 3.3.3.

3.4.3 Air Quality

Air quality in a given location is described by the concentration of various pollutants in the atmosphere, generally expressed in units of ppm or micrograms per cubic meter ($\mu g/m^3$). Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The significance of a pollutant concentration is determined by comparing it

to federal and state ambient air quality standards. These standards represent the maximum allowable atmospheric concentrations that may occur and still protect public health and welfare, with a reasonable margin of safety. The federal standards are established by the U.S. EPA and termed the National Ambient Air Quality Standards (NAAQS). The state of Missouri has adopted the NAAQS as their representative air quality standards. The NAAQS are presented in Table 3.4-2.

The main pollutants of concern are ozone (O_3), carbon monoxide (CO), nitrogen oxides (NO_x), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter equal to or less than 10 microns in diameter (PM_{10}). NO_x include all oxide species of nitrogen. NO_x are of concern because of their potential contribution to ozone formation. Only that portion of total NO_x that is measurable as NO_2 is subject to the NAAQS. The previous NAAQS for particulate matter were based upon total suspended particulate (TSP) levels; they were replaced in 1987 by ambient standards based only on the PM_{10} fraction of TSP.

Lead emissions are not addressed in this EIS because there are no known lead emission sources in the region or included in the reuse alternatives. Lead concentrations are monitored in a number of high population density areas throughout the United States and all sites meet the quarterly primary and secondary standard of 1.5 $\mu g/m^3$.

The existing air quality of the affected environment is defined by air quality data and emissions information. Air quality data are obtained by examining records from air quality monitoring stations maintained by the Kansas City Air Quality Program (KCAQP). Information on pollutant concentrations measured for short-term (24 hours or less) and long-term (annual) averaging periods is extracted from the monitoring station data in order to characterize the existing air quality background of the area. Emission inventory information for the affected environment was obtained from the U.S. EPA Region VII and from Richards-Gebaur AFB. Inventory data are separated by pollutant and reported in tons per year in order to describe the baseline conditions of pollutant emissions in the area.

Identifying the ROI for an air quality assessment requires knowledge of the pollutant types, source emission rates and release parameters, the proximity relationships of project emission sources to other emission sources, and local and regional meteorological conditions. For inert pollutants (all pollutants other than ozone, its precursors, and NO_2), the ROI is generally limited to an area extending a few miles downwind from the source.

Ozone is a secondary pollutant formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors. Ozone precursors are mainly volatile organic compounds (VOCs) in the form of hydrocarbons and NO_x. VOCs are compounds containing carbon, excluding CO, carbon

Table 3.4-2. National and Missouri Ambient Air Quality Standards

Pollutant	Averaging Time	----National/Missouri Standards[a]----	
		Primary[b,c]	Secondary[b,d]
Ozone	1-Hour	0.12 ppm (235 $\mu g/m^3$)	Same as Primary Standard
Nitrogen dioxide	Annual	0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard
Carbon monoxide	8-Hour	9 ppm (10,000/$\mu g/m^3$)	---
	1-Hour	35 ppm (40,000 $\mu g/m^3$)	---
Sulfur dioxide	Annual	80 $\mu g/m^3$ (0.03 ppm)	---
	24-Hour	365 $\mu g/m^3$ (0.14 ppm)	---
	3-Hour	---	1,300 $\mu g/m^3$ (0.5 ppm)
PM_{10}	Annual	50 $\mu g/m^3$[e]	Same as Primary Standard
	24-Hour	150 $\mu g/m^3$	Same as Primary Standard
Hydrogen sulfide[f]	1/2-Hour	0.05 ppm (70 $\mu g/m^3$)[g]	---
	1/2-Hour	0.03 ppm (42 $\mu g/m^3$)[h]	---
Sulfuric acid[f]	24-Hour	10 $\mu g/m^3$ [i]	---
	1-Hour	30 $\mu g/m^3$ [j]	---
Lead	Quarterly	1.5 $\mu g/m^3$	Same as Primary Standard

Notes: (a) Standards, other than those for ozone and those based on annual averages or arithmetic means, are not to be exceeded more than once per year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
(b) Concentrations are expressed first in the units in which they were promulgated. Equivalent units given in parentheses are based upon on a reference temperature of 25 degrees Centigrade and a reference pressure of 760 millimeters of mercury (1,013.2 millibar); ppm in this table refers to parts per million by volume, or micromoles of pollutant per mole of gas.
(c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect public health.
(d) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
(e) Calculated as arithmetic mean.
(f) Missouri standards; not NAAQS.
(g) 1/2-hour average not be exceeded more than two times per year.
(h) 1/2-hour average not be exceeded more than two times in any five consecutive days.
(i) 24-hour average not to be exceeded more than once in any 90 consecutive days.
(j) 1-hour average not to be exceeded more than once in any two consecutive days.
$\mu g/m^3$ = micrograms per cubic meter.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
ppm = parts per million.

Sources: Clean Air Act, Title 42 U.S.C. §7401-7671; Missouri Title 10 §6.010.

dioxide (CO_2), carbonic acid, metallic carbides, metallic carbonates, and ammonium carbonate. By U.S. EPA regulatory definition, VOCs do not include methane or other nonreactive hydrocarbons such as methylene chloride. NO_x is the designation given to the group of all oxygenated nitrogen species, including nitrous oxide (N_2O), nitric oxide (NO), NO_2, nitrogen trioxide (NO_3), nitrogen tetroxide (N_2O_4), nitric anhydride (N_2O_6), and nitrous anhydride (N_2O_3). Although all of these compounds can exist in air, only N_2O, NO, and NO_2 are present in any appreciable quantities.

The ROI for ozone may extend much farther downwind than the ROI for inert pollutants. In the presence of solar radiation, the maximum effect of precursor emissions on ozone levels usually occurs several hours after they are emitted and, therefore, many miles from the source. Ozone and its precursors transported from other regions can also combine with local emissions to produce high local ozone concentrations. Ozone concentrations are generally the highest during the summer months and coincide with periods of maximum solar radiation. Maximum ozone concentrations tend to be regionally distributed because precursor emissions are homogeneously dispersed in the atmosphere.

Like ozone, NO_2 emissions are also regionally distributed. NO_2 is formed primarily by the conversion of NO to NO_2 in the presence of oxygen (either during combustion or in the atmosphere). NO is produced by fuel combustion in both stationary and mobile sources such as automobiles and aircraft. The amount of NO produced is dependent upon the combustion temperature and the rate of exhaust gas cooling. Higher temperatures and rapid cooling rates produce greater quantities of NO. Where higher NO concentrations and temperatures exist, some of the NO is immediately oxidized to NO_2. The amount of immediate NO_2 combustion generation generally varies from 0.5 to 10 percent of the NO present (U.S. EPA, 1971). The remaining unconverted NO is oxidized to NO_2 in the atmosphere primarily through photochemical secondary reactions initiated by the presence of sunlight. These photochemical reactions may take place hours after the initial NO release and many miles from the original source, dependent upon the prevailing meteorological conditions.

Emissions of ozone precursors and NO_2 from the reuse-related construction and operational activities would affect the existing airshed surrounding Richards-Gebaur AFB, i.e., the Metropolitan Kansas Interstate Air Quality Control Region (No. 094). This control region includes Buchanan, Cass, Clay, Jackson, Platte, and Ray counties in the state of Missouri, and Johnson, Leavenworth, and Wyandotte counties in the state of Kansas. However, due to the large size of the control region and the relative sparsity of emissions data from this area, the ROI for ozone precursors and NO_2 is considered for the purpose of this air quality analysis to be Jackson and Cass counties. These counties and their relationship to Richards-Gebaur AFB and the Metropolitan Kansas Interstate Air Quality Control Region are

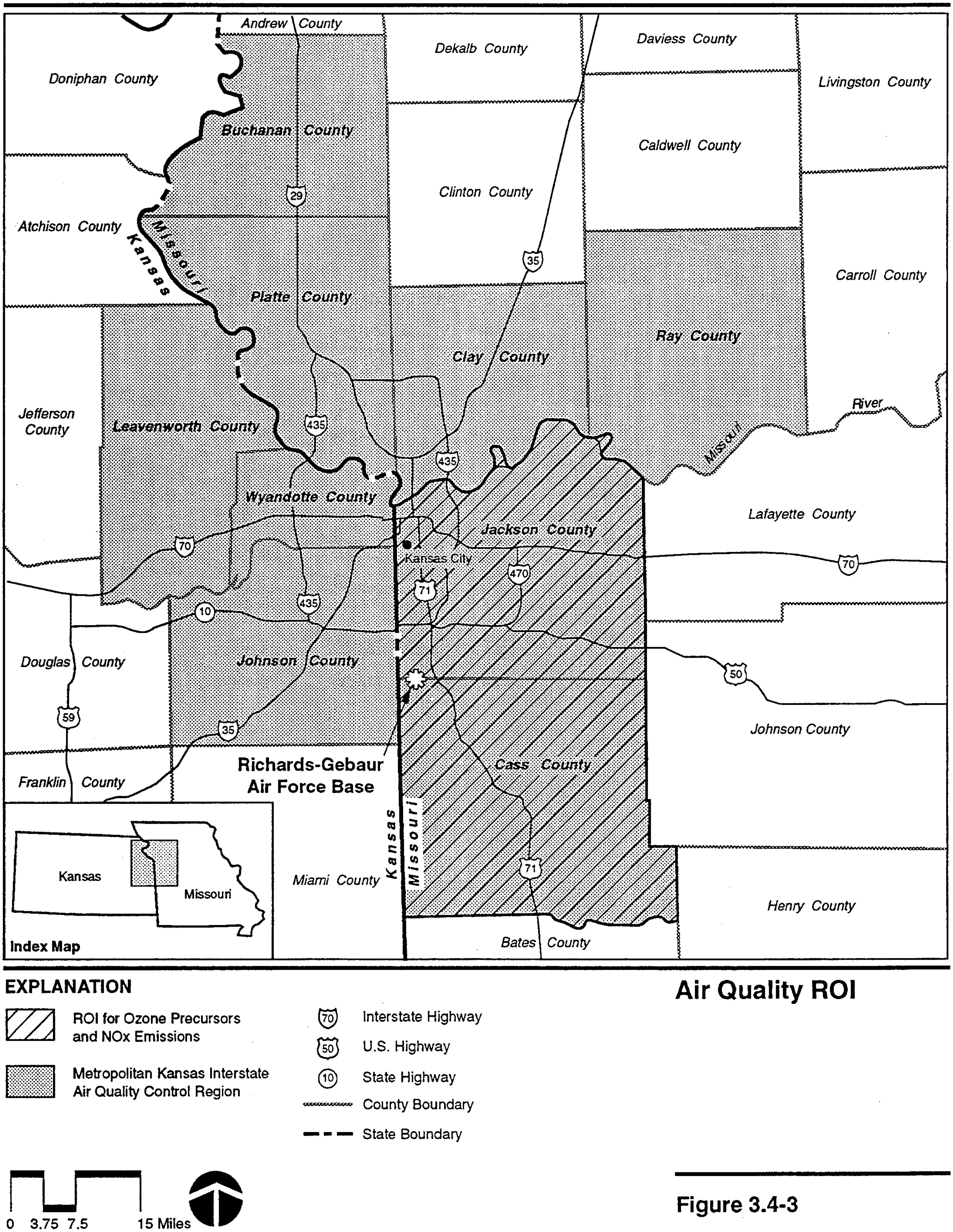
shown in Figure 3.4-3. Reuse-related emissions of VOC, NO_x, and NO_2 are compared to emissions generated within Jackson and Cass counties. The ROI for emissions of the inert pollutants (CO, SO_2, and PM_{10}) is limited to the more immediate area of Richards-Gebaur AFB.

The federal Clean Air Act (CAA), most recently amended in November 1990, dictates that project emission sources must comply with the air quality standards and regulations that have been established by federal, state, and county regulatory agencies. These standards and regulations focus on (1) the maximum allowable ambient pollutant concentrations resulting from project emissions, both separately and combined with other surrounding sources, and (2) the maximum allowable emissions from the project.

Prior to the 1990 CAA Amendments, federal regulation of hazardous air emissions was very limited. Section 112, as amended in 1990, requires U.S. EPA to regulate a greatly expanded list of hazardous air pollutants (HAPs). Additionally, U.S. EPA must publish a list of all categories and subcategories of emission sources of HAPs. After identifying and listing sources of HAPs, U.S. EPA must promulgate emission standards that are equivalent to maximum achievable control technology (MACT). By 2000, it is expected that final U.S. EPA regulations will control HAP emissions and require adoption of costly control measures for most medium- and large-sized sources of HAPs.

3.4.3.1 Regional Air Quality. Climate conditions around Richards-Gebaur AFB vary substantially on a seasonal, and at times even daily, basis. Because the surrounding terrain is gently rolling without any significant modifying influences for miles in any direction, the area is often affected by the importation of warm or cold air from source regions many hundreds of miles away. Moist air masses flowing from the Gulf of Mexico, hot and dry air masses from the semiarid southwest, or cold polar continental air masses from the north may at any given time be the dominating influence affecting weather in the area.

Summer in the Richards-Gebaur AFB area is characterized by warm days and mild nights, with mostly moderate relative humidity. July is the warmest month, with a mean high temperature of 89° F and a mean low of 70° F. January is the coldest month, with a mean low temperature of 21° F and a mean high of 29° F. Snowfall normally occurs from November to April and averages about 20 inches per year; precipitation averages 37 inches per year, mostly from April through September. Wind speeds average 11 mph and occur from variable directions. Heavy fog, which restricts visibility to a distance of one-quarter mile or less, occurs an average of 23 days per year. According to U.S. EPA guidelines, an area with air quality better than the NAAQS is designated as being in attainment; areas with worse air quality are classified as nonattainment areas. An area is considered to be in attainment of the NAAQS (except those for ozone and those based on



Air Quality ROI

Figure 3.4-3

annual averages or annual arithmetic means) if the standard for a pollutant is not exceeded more than once a year. An area is considered to be in attainment for ozone if the maximum hourly concentration exceeds the standard on no more than 1 day per calendar year. Pollutants in an area may be designated as unclassified when there is a lack of data for the U.S. EPA to form a basis of attainment status. An area designated as unclassified is assumed to be in attainment. Currently Jackson and Cass counties are designated by the U.S. EPA as being in attainment of the NAAQS for all criteria pollutants except lead and PM_{10}. The counties are unclassified for lead and PM_{10} (Pawlowski, 1993).

New or modified major stationary sources in the area of Richards-Gebaur AFB would be subject to Prevention of Significant Deterioration (PSD) review to ensure that these sources are constructed without significant adverse deterioration of the clean air in the area. Emissions from any new or modified source must be controlled using Best Available Control Technology (BACT). The air quality impacts in combination with other PSD sources in the area must not exceed the maximum allowable incremental increases identified in Table 3.4-3. Certain national parks and wilderness areas are designated as Class I areas, where any appreciable deterioration in air quality is considered significant. Class II areas are those where moderate, well-controlled industrial growth could be permitted. Class III areas allow for greater industrial development. The area surrounding Richards-Gebaur AFB is designated by the U.S. EPA as Class II. There are no PSD Class I areas within 100 miles of Richards-Gebaur AFB.

Table 3.4-3. Maximum Allowable Pollutant Concentration Increases under PSD Regulations

		Maximum Allowable Increment ($\mu g/m^3$)		
Pollutant	Averaging Time	Class I	Class II	Class III
Nitrogen dioxide	Annual	2.5	25	50
Sulfur dioxide	Annual	2	20	40
	24-Hour	5	91	182
	3-Hour	25	512	700
PM_{10}	Annual	4	17	34
	24-Hour	8	30	60

Note: Class I areas are regions in which the air quality is intended to be kept pristine, such as national parks and wilderness areas. All other lands are initially designated Class II. Individual states have the authority to redesignate Class II lands as Class III to allow for maximum industrial use.
$\mu g/m^3$ = micrograms per cubic meter.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
PSD = prevention of significant deterioration.

Source: 40 CFR Parts 51 and 52, as revised June 3, 1993.

In addition to the requirement for PSD review, regulations are pending under Title V of the CAA that would require a permit for any of the following sources:

- A source that has the potential to emit 10 tons or more of a single HAP in a 1-year period.

- A source that has the potential to emit a total of 25 tons or more of HAPs in a 1-year period.

- A source that has the potential to emit 100 tons or more of any criteria pollutant in a 1-year period.

- A source that is required to meet New Source Performance Standards.

- A source that is located in a nonattainment area.

The permitting authority must notify a state if one of the above sources is within 50 miles of that state or could affect the air quality of that state. The affected states then have the opportunity to make recommendations concerning the terms and conditions of the permit that would be issued to the source.

The KCAQP operates air quality monitoring stations in Jackson and Cass counties. These include the Worlds of Fun station, 28 miles north-northeast of the base; the KCI Airport station, 37 miles north-northwest; the Carnival, 724 Troost, and 1517 Locust Avenue stations, all approximately 20 miles north; the Parvin station, 26 miles north; the Bendix station, 10 miles north-northeast; the Van Brunt Police Station, 19 miles northeast; and the 5130 Duramus station, approximately 15 miles northeast. Various criteria pollutants are measured at these stations, as shown in Table 3.4-4. In addition, ozone and PM_{10} ambient air quality data are measured within the boundary of Richards-Gebaur AFB. The maximum concentrations of the pollutants measured at these stations are presented in Table 3.4-4. The maximum 1-hour ozone concentration exceeded the NAAQS at one or more of the monitoring stations in each of the years from 1990 to 1992. However, since the maximum hourly concentration was not exceeded on more than 1 day per year at any station, the ozone standard was attained.

Preclosure Reference. Preclosure pollutant concentrations due to aircraft emissions in the immediate area of Richards-Gebaur Airport were estimated using the Emissions and Dispersion Modeling System (EDMS), which simulates the dispersion of emissions from aircraft operations (Segal, 1991a, b, c). EDMS was developed jointly by the FAA and the U.S. Air Force specifically for the purpose of generating airport and airbase emission inventories and for calculating the concentrations caused by these emissions as they disperse downwind. U.S. EPA added EDMS to its list of approved

Table 3.4-4. Existing Air Quality in the Area around Richards-Gebaur AFB

		Maximum Concentration by Year[a] ppm ($\mu g/m^3$)		
Pollutant/Station	Averaging Time	1990	1991	1992
Ozone				
Worlds of Fun	1-Hour	0.126 (246)	0.092 (181)	0.094 (185)
KCI Airport		0.136 (267)	0.100 (196)	0.132 (258)
Richards-Gebaur AFB		0.107 (209)	0.129 (252)	0.094 (185)
Nitrogen dioxide				
Worlds of Fun	Annual	0.0123 (23)	0.0133 (25)	0.0101 (19)
KCI Airport		0.0064 (12)	0.0043 (8)	0.0069 (13)
Carbon monoxide				
Carnival	8-Hour	3.59 (4,100)	3.33 (3,800)	2.36 (2,700)
Parvin Road		4.38 (5,000)	3.06 (3,500)	1.75 (2,000)
Bendix		1.23 (1,400)	0.88 (1,000)	1.14 (1,300)
Carnival	1-Hour	8.92 (10,200)	10.41 (11,900)	8.22 (9,400)
Parvin Road		14.09 (16,100)	16.54 (18,900)	8.22 (9,400)
Bendix		10.41 (11,900)	3.85 (4,400)	4.55 (5,200)
Sulfur dioxide				
Worlds of Fun	Annual	0.0000 (0)	0.0008 (2)	0.0000 (0)
KCI Airport		0.0004 (1)	0.0011 (3)	0.0000 (0)
724 Troost		0.0011 (3)	0.0050 (13)	0.0015 (4)
World of Fun	24-Hour	0.0004 (1)	0.0031 (8)	0.0004 (1)
KCI Airport		0.0015 (4)	0.0046 (12)	0.0004 (1)
724 Troost		0.0046 (12)	0.0214 (56)	0.0061 (16)
Worlds of Fun	3-Hour	0.0360 (94)	0.0237 (62)	0.0184 (48)
KCI Airport		0.0230 (60)	0.0191 (50)	0.0191 (50)
724 Troost		0.0410 (107)	0.0222 (58)	0.0582 (152)
PM_{10}[b]				
1517 Locust	Annual (Arithmetic)	30.7	27.9	29.4
5130 Duramus		31.4	30.4	25.3
Richards-Gebaur AFB		23.4	21.3	18.5
Van Brunt Police		27.5	25.8	26.5
724 Troost		28.7	29.0	27.2
1517 Locust	24-Hour	81	56	66
5130 Duramus		75	61	50
Richards-Gebaur AFB		85	44	43
Van Brunt Police		72	54	92
724 Troost		52	59	57

Notes: (a) Ambient air quality data were available by month as maximum hourly values (100th percentile), and 99th, 90th, and 50th percentile values. The annual concentration was assumed equal to the 50th percentile value; the 24-hour concentration was assumed equal to the greater of 1 $\mu g/m^3$ or four times the annual concentration; the 8-hour concentration was assumed equal to the highest 90th percentile; and the 3-hour concentration was assumed equal to the highest 99th percentile.

(b) Units for PM_{10} are presented in $\mu g/m^3$ only.

$\mu g/m^3$ = micrograms per cubic meter.

PM_{10} = particulate matter equal to or less than 10 microns in diameter.

ppm = parts per million.

models in July 1993 (Federal Register, Vol. 58, No. 137, 338816). The EDMS model uses U.S. EPA aircraft emission factors and information on peak and annual landing and takeoff cycles to produce an emissions inventory report for the aircraft operations.

The results of the EDMS modeling for preclosure conditions are provided in Table 3.4-5. The values in Table 3.4-5 represent the maximum concentrations that occurred in the vicinity of the runways as a result of military and civilian aircraft operations during 1992. The sums of all aircraft-related pollutant concentrations plus background concentrations are less than the applicable standards.

Table 3.4-5. Air Quality Modeling Results for Preclosure Conditions in the Vicinity of the Runways at Richards-Gebaur Airport ($\mu g/m^3$)

Pollutant	Averaging Time	Maximum Impact[a]	Background Concentration[b]	Limiting Standard
Carbon monoxide	8-hour	212	2,760	10,000
	1-hour	304	10,820	40,000
Sulfur dioxide	Annual	1.1	3	80
	24-hour	4.6	12	365
	3-hour	10.3	76	1,300
PM_{10}	Annual	0.4	27	50
	24-hour	1.5	63	150

Notes: (a) Maximum impact in all cases occurred at a receptor located 250 feet from the north end of the runway.
(b) Background concentrations assumed to equal the mean of maximum concentrations measured during the period from 1990-1992 (refer to Table 3.4-4).
$\mu g/m^3$ = micrograms per cubic meter.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.

Closure Baseline. It can be reasonably assumed that pollutant concentrations in the region surrounding Richards-Gebaur AFB at base closure would be less than concentrations experienced under preclosure conditions due to the implementation of regional air emission control measures. Pollutant concentrations in the area of the base itself would be lower than the preclosure levels due to the reduction or elimination of numerous emission sources associated with normal base activities (e.g., all current Air Force Reserve aircraft and aerospace ground activities would be eliminated). The closure would also reduce the number of motor vehicles operating in the surrounding area. Emissions associated with military vehicles assigned to the base, military and civilian employee private vehicles, military retirees visiting Richards-Gebaur AFB facilities, and truck traffic associated with base operations would all be eliminated, with the exception of those vehicles associated with the OL and ongoing civilian, Army, and Navy operations.

The results of EDMS modeling in the vicinity of the runways under closure conditions are provided in Table 3.4-6. The values in Table 3.4-6 represent

Table 3.4-6. Air Quality Modeling Results for Closure Conditions in the Vicinity of the Runways at Richards-Gebaur Airport ($\mu g/m^3$)

Pollutant	Averaging Time	Maximum Impact[a]	Background Concentration[b]	Limiting Standard
Carbon monoxide	8-hour	199	2,760	10,000
	1-hour	284	10,820	40,000
Sulfur dioxide	Annual	0.4	3	80
	24-hour	1.4	12	365
	3-hour	3.1	76	1,300
PM_{10}	Annual	0.2	27	50
	24-hour	0.9	63	150

Notes: (a) Maximum impact in all cases occurred at a receptor located 250 feet from the north end of the runway.
(b) Background concentrations assumed to equal the mean of maximum concentrations measured during the period from 1990-1992. (refer to Table 3.4-4).
$\mu g/m^3$ = micrograms per cubic meter.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.

the maximum concentrations that would occur as a result of civilian and military transient aircraft operations in 1994. The sums of all aircraft-related pollutant concentrations plus background concentrations are less than the applicable NAAQS.

3.4.3.2 Air Pollutant Emission Sources

Preclosure Reference. The Richards-Gebaur AFB, Cass County, and Jackson County emissions inventories representative of preclosure conditions are presented in Table 3.4-7. The base inventory information is for 1992. The most recent emission inventories representative of preclosure conditions in Cass and Jackson counties were completed in 1990. The base emissions presented in Table 3.4-7 are based on inventory calculations for direct military and civilian sources associated with the base. The primary direct emission sources include aircraft flying operations, aerospace ground equipment, aircraft ground operations, heating and power production, and motor vehicles. Fuel evaporation losses and surface coatings also contribute substantially to the amount of VOC emissions released at Richards-Gebaur AFB.

Emissions reported for Cass and Jackson counties are grouped into the categories of point sources, area sources, and mobile sources. The point source category includes emissions from permitted stationary sources within the counties. The area source category includes emissions from such sources as service station fueling, unloading and breathing losses, dry cleaning operations, solvent use, municipal wastewater treatment, natural gas use, structure fires, and pesticide application. The mobile source category includes emissions from trucks, autos, buses, motorcycles, trains,

Table 3.4-7. Preclosure Emissions Inventory (tons per year)

Source	VOC	NO_x	CO	SO_2	PM_{10}
Richards-Gebaur AFB[a]					
Aircraft Flying Operations					
Military	15.30	10.14	51.79	1.20	0.71
Civilian	3.11	2.13	79.94	0.24	0.30
Aircraft Ground Operations					
Military	1.40	1.27	4.96	0.09	0.01
Civilian	0.62	0.12	1.97	0.02	0.00
Aerospace Ground Equipment[b]	0.13	1.88	0.41	0.02	0.13
Heating and Power Production[c]					
Military	0.13	6.53	1.62	0.64	0.16
Civilian	0.01	0.72	0.18	0.07	0.02
Motor Vehicles[b]	1.01	1.10	12.42	0.001	0.005
Surface Coating[b]	2.20	--	--	--	--
Fuel Evaporation Losses[b]	28.51	--	--	--	--
Solvent Degreasing[b]	0.46	--	--	--	--
Base Total	52.88	23.89	153.29	2.28	1.34
Cass County[d]					
Point Sources	6	68	13	6	310
Area Sources	1,177	977	ND	ND	ND
Mobile Sources	928	1,106	ND	ND	ND
Cass County Total	2,111	2,151	13	6	310
Jackson County[d]					
Point Sources	3,691	30,337	1,161	59,265	1,838
Area Sources	11,681	9,692	ND	ND	ND
Mobile Sources	9,230	10,985	ND	ND	ND
Jackson County Total	24,602	51,014	1,161	59,265	1,838

Notes: (a) Inventory data are representative of 1992.

(b) Data are available for Air Force usage only. Emissions from civilian, and other military (transient) operations are assumed to be negligible for this category.

(c) The heating and power plant primarily services military facilities, with only limited service to civilian facilities. Split assumed to be 90 percent to military facilities and 10 percent to civilian facilities.

(d) Inventory data are representative of 1990. Point source data obtained from the MDNR. Area and mobile source data for NO_x and VOC emissions in Jackson County obtained from projections contained in the Kansas City Ozone State Implementation Plan. Area and mobile source emissions of NO_x and VOC for Cass County were estimated by multiplying the ratio of Cass County 1990 population (63,808 persons) to Jackson County 1990 population (633,232 persons) times the Jackson County emissions. Area and mobile source data for CO, SO_2, and PM_{10} were not available for either county.

CO = carbon monoxide.
MDNR = Missouri Department of Natural Resources.
ND = no data.
NO_x = nitrogen oxides.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Sources: MDNR, 1988, 1993b.

aircraft, boats, agricultural equipment, construction equipment, industrial equipment, off-road vehicles, and lawn and garden equipment. Emissions from Richards-Gebaur AFB activities are included as part of the total county emissions.

Although the Richards-Gebaur AFB emission inventory shown in Table 3.4-7 provides a preclosure reference to on-base emissions, the inventory does not consider off-base air emissions from indirect sources related to Richards-Gebaur AFB. (Indirect source emissions include emissions from military dependents and from the residential, commercial, and industrial infrastructure sources which support operation of the base. Direct emissions include emissions from those on-base sources as shown in Table 3.4-7). In addition, the inventory data presented in Table 3.4-7 are difficult to compare to emissions from future reuse scenarios that require calculation by different forecasting methods for direct and indirect emissions. Therefore, Table 3.4-8 provides the total base-related emissions associated with both direct and indirect sources using the same forecasting methods applied to the reuse alternatives. Appendix J describes the consistent methodology used to recalculate Richards-Gebaur AFB preclosure emissions for direct comparison with projected reuse-related emissions.

Table 3.4-8. Total Base-Related Emissions from Direct and Indirect Sources (tons per year)

	VOC	NO_x	CO	SO_2	PM_{10}
Preclosure (1992)	96.8	95.7	154.3	11.7	7.5
Closure (1994)	7.8	5.9	113.1	0.7	0.7

CO = carbon monoxide.
NO_x = nitrogen oxides.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Closure Baseline. The base-related emissions for Richards-Gebaur AFB at base closure (1994) were estimated by calculating the direct and indirect emissions associated with the OL and ongoing civilian and transient military aviation-related activities (see Table 3.4-8). The reduction in base-related emissions from preclosure conditions reflects the loss of both direct and indirect Air Force sources due to reduced on-base activities, reduced facility heating and power requirements, and the reduction in direct and indirect population associated with Richards-Gebaur AFB at the time of closure.

3.4.4 Noise

The characteristics of sound include parameters such as amplitude, frequency, and duration. Sound can vary over an extremely large range of

amplitudes. The decibel (dB), a logarithmic unit that accounts for the large variations in amplitude, is the accepted standard unit for the measurement of sound. Table 3.4-9 presents examples of typical sound levels. Different sounds may have different frequency contents. When measuring sound to determine its effects on a human population, A-weighted sound levels (dB) are typically used to account for the frequency response of the human ear. A-weighted sound levels represent adjusted sound levels. The adjustments, established by the American National Standards Institute (1983), are applied to the frequency content of the sound.

Noise is usually defined as sound that is undesirable because it interferes with speech communication and hearing, is intense enough to damage hearing, or is otherwise annoying. Noise levels often change with time; therefore, to compare levels over different time periods, several descriptors were developed that take into account this time-varying nature. These descriptors are used to assess and correlate the various effects of noise on man and animals, including land-use compatibility, sleep interference, annoyance, hearing loss, speech interference, and startle effects. A day-night weighted average sound level (DNL) was developed to evaluate the total community noise environment. DNL (sometimes abbreviated as L_{dn}) is the average A-weighted acoustical energy during a 24-hour period with a 10 dB adjustment added to the nighttime levels (between 10:00 p.m. and 7:00 a.m.). This adjustment is an effort to account for the increased sensitivity to nighttime noise events. DNL was endorsed by the U.S. EPA for use by federal agencies and has been adopted by HUD, FAA, and DOD.

DNL is an accepted unit for quantifying human annoyance to general environmental noise, which includes aircraft noise. The Federal Interagency Committee on Urban Noise developed land-use compatibility guidelines for noise in terms of DNL (U.S. Department of Transportation, 1980). Table 3.4-10 provides FAA-recommended DNL ranges for various land use categories based upon the committee's guidelines. The FAA guidelines were used in this study to determine noise impacts.

The ROI for noise sources at Richards-Gebaur AFB is defined using the FAA-recommended land use compatibility guidelines and any applicable state or local guidelines. The area most affected by noise due to the base disposal and reuse is limited to the area in and around the base within the DNL 65 dB contour. This includes, but is not limited to, the communities of Belton and Kansas City.

Missouri state guidelines (Missouri State Highway and Transportation Department, 1991) state that noise impacts must be addressed for construction of new highways and for significant changes in alignment of existing highways. The guidelines list residences, churches, schools, libraries, hospitals, nursing homes, apartment buildings, and condominiums as noise-sensitive receptors. The guidelines further state that noise

Table 3.4-9. Comparative Sound Levels

Common Outdoor Sound Levels	Sound Level (dB)	Common Indoor Sound Levels
	110	Rock Band
Jet Flyover at 1,000 feet		
	100	
		Inside Subway Train (New York)
Gas Lawnmower at 3 feet		
	90	
Diesel Truck at 50 feet		Food Blender at 3 feet
Noisy Urban Daytime		Garbage Disposal at 3 feet
	80	
		Shouting at 3 feet
Gas Lawnmower at 100 feet		Vacuum Cleaner at 10 feet
	70	
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet		
	60	
		Large Business Office
	50	Dishwasher Next Room
Quiet Urban Nighttime		Small Theater, Large Conference Room (Background)
	40	
Quiet Suburban Nighttime		Library
	30	Bedroom at Night
Quiet Rural Nighttime		Concert Hall (Background)
	20	
		Broadcast and Recording Studio
	10	
		Threshold of Hearing
	0	

Table 3.4-10. Land Use Compatibility with Yearly Day-Night Average Sound Levels
Page 1 of 2

Land Use	Below 65	65-70	70-75	75-80	80-85	Over 85
	Yearly Day-Night Average Sound Level (DNL) in Decibels					
Residential						
Residential, other than mobile homes and transient lodgings	Y	N[a]	N[a]	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N[a]	N[a]	N[a]	N	N
Public Use						
Schools	Y	N[a]	N[a]	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[b]	Y[c]	Y[d]	Y[d]
Parking	Y	Y	Y[b]	Y[c]	Y[d]	N
Commercial Use						
Offices, business, and professional	Y	Y	25	30	N	N
Wholesale and retail--building materials, hardware, and farm equipment	Y	Y	Y[b]	Y[c]	Y[d]	N
Retail trade--general	Y	Y	25	30	N	N
Utilities	Y	Y	Y[b]	Y[c]	Y[d]	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y[b]	Y[c]	Y[d]	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y[f]	Y[g]	Y[h]	Y[h]	Y[h]
Livestock farming and breeding	Y	Y[f]	Y[g]	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y[e]	Y[e]	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Letters in parentheses refer to notes (see next page). The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Key

Y (Yes)	Land use and related structures compatible without restrictions.
N (No)	Land use and related structures are not compatible and should be prohibited.
25, 30, or 35	Land use and related structures generally compatible; measures to achieve Noise Level Reduction (NLR) of 25, 30, or 35 decibels (dB) must be incorporated into design and construction of structure.

Table 3.4-10. Land Use Compatibility with Yearly Day-Night Average Sound Levels
Page 2 of 2

Notes

(a) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(b) Measures to achieve an NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.
(c) Measures to achieve an NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
(d) Measures to achieve an NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
(e) Land use compatible provided special sound reinforcement systems are installed.
(f) Residential buildings require an NLR of 25.
(g) Residential buildings require an NLR of 30.
(h) Residential buildings not permitted.

Source: Derived from Federal Aviation Regulations Part 150 Airport Noise Compatibility Planning (FAA, 1989).

abatement should be provided when noise at sensitive receptors exceeds an equivalent sound level (L_{eq}) of 65 dB. The L_{eq} is the equivalent steady state level that would contain the same acoustical energy as the time varying level during the same time interval.

The Kansas City Noise Control Code (City of Kansas City, 1982) specifically addresses allowable sound levels associated with many types of activities and devices, including, but not limited to, aircraft and motor vehicles. It prohibits the operation of any aircraft that produces noise levels exceeding 65 dB, unless the aircraft is operated in conformity with federal law or regulations (in which case it is exempt from this restriction). Motor vehicles are restricted based on gross weight, speed, type of road surface, and distance to receiver. In addition, the ordinance prohibits creating any sound within a noise-sensitive zone which would disrupt the activities normally conducted within the zone. Noise-sensitive zones are defined as areas containing a hospital, nursing homes, or similar activity.

DNL is used in this report because it is the noise descriptor recognized by the FAA and Air Force for airfield environments. DNL is sometimes supplemented with other metrics, primarily the L_{eq}. Occasionally, the Sound Exposure Level (SEL) is used to supplement DNL, especially where sleep disturbance is a concern. The SEL value represents the A-weighted sound level integrated over the entire duration of the noise event and referenced to a duration of 1 second. When an event lasts longer than 1 second, the SEL value will be higher than the highest sound level during the event. SEL is used in this report when discussing sleep disturbance effects.

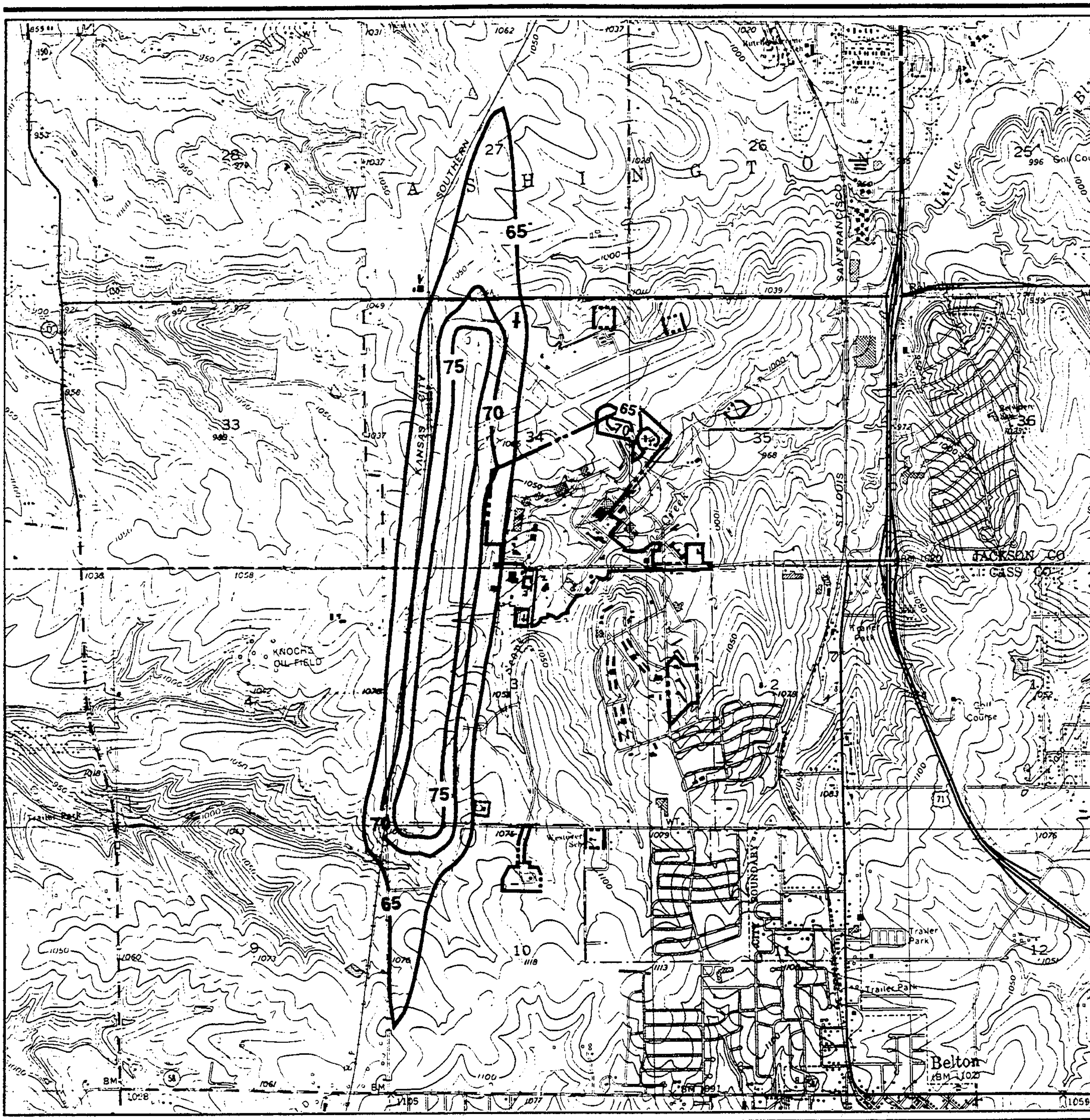
Appendix I provides additional information about the measurement and prediction of noise. This appendix also provides more information on the units used in describing noise, as well as information about the effects of noise such as annoyance, sleep interference, speech interference, health effects, and effects on animals.

3.4.4.1 Existing Noise Levels. Typical noise sources in and around airfields usually include aircraft, surface traffic, and other human activities. Military and civilian aircraft operations, surface traffic on local streets and highways, and railroad traffic on local rail lines are the existing primary sources of noise in the vicinity of Richards-Gebaur AFB. In airport analyses, areas with DNL above 65 dB are often considered in land-use compatibility planning and impact assessment; therefore, the contours of DNL greater than 65 dB are of particular interest. Contours above DNL 65 dB are modeled and analyzed in 5 dB intervals.

Preclosure Reference. Aircraft noise at Richards-Gebaur Airport occurs during aircraft engine warmup, maintenance and testing, taxiings, takeoffs, approaches, and landings. Noise contours for preclosure military and civilian aircraft operations (see Table 3.2-4) were modeled using the Air Force-developed and FAA-approved Noise Exposure Model (NOISEMAP) version 6.1 and included information on aircraft types; runway use; runup locations; takeoff and landing flight tracks; aircraft altitude, speeds, and engine power settings; and number of daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) operations. The noise contours for 1992 are shown in Figure 3.4-4. Only those contours equal to or above DNL 65 dB are shown.

Surface vehicle traffic noise levels for roadways in the vicinity of Richards-Gebaur AFB were analyzed using the Federal Highway Administration's (FHWA's) Highway Noise Model (FHWA, 1978). This model incorporates vehicle mix, traffic volume projections, and speed to generate DNLs. The noise levels are then presented as a function of distance from the centerline of the nearest road. The results of the modeling for surface traffic are presented in Table 3.4-11. The actual distances to the DNLs may be less than those presented in the table because the screening effects of intervening buildings, terrain, and walls were not accounted for in the modeling. Appendix I data include AADTs, traffic mix, and speeds.

Closure Baseline. In order to define the noise environment due to aircraft operations at Richards-Gebaur Airport for the closure baseline, NOISEMAP was used to predict DNL 65, 70, and 75 dB noise contours from projected civilian and military transient aircraft operations at Richards-Gebaur Airport (see Table 3.2-5). Input data to NOISEMAP are as described above. The results of the closure baseline aircraft noise modeling are presented as noise contours in Figure 3.4-5.

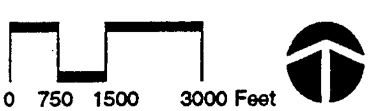


EXPLANATION

— 65 — DNL Noise Contour (in 5 dB intervals)

- - - - Base Boundary

Preclosure Aircraft Noise Contours



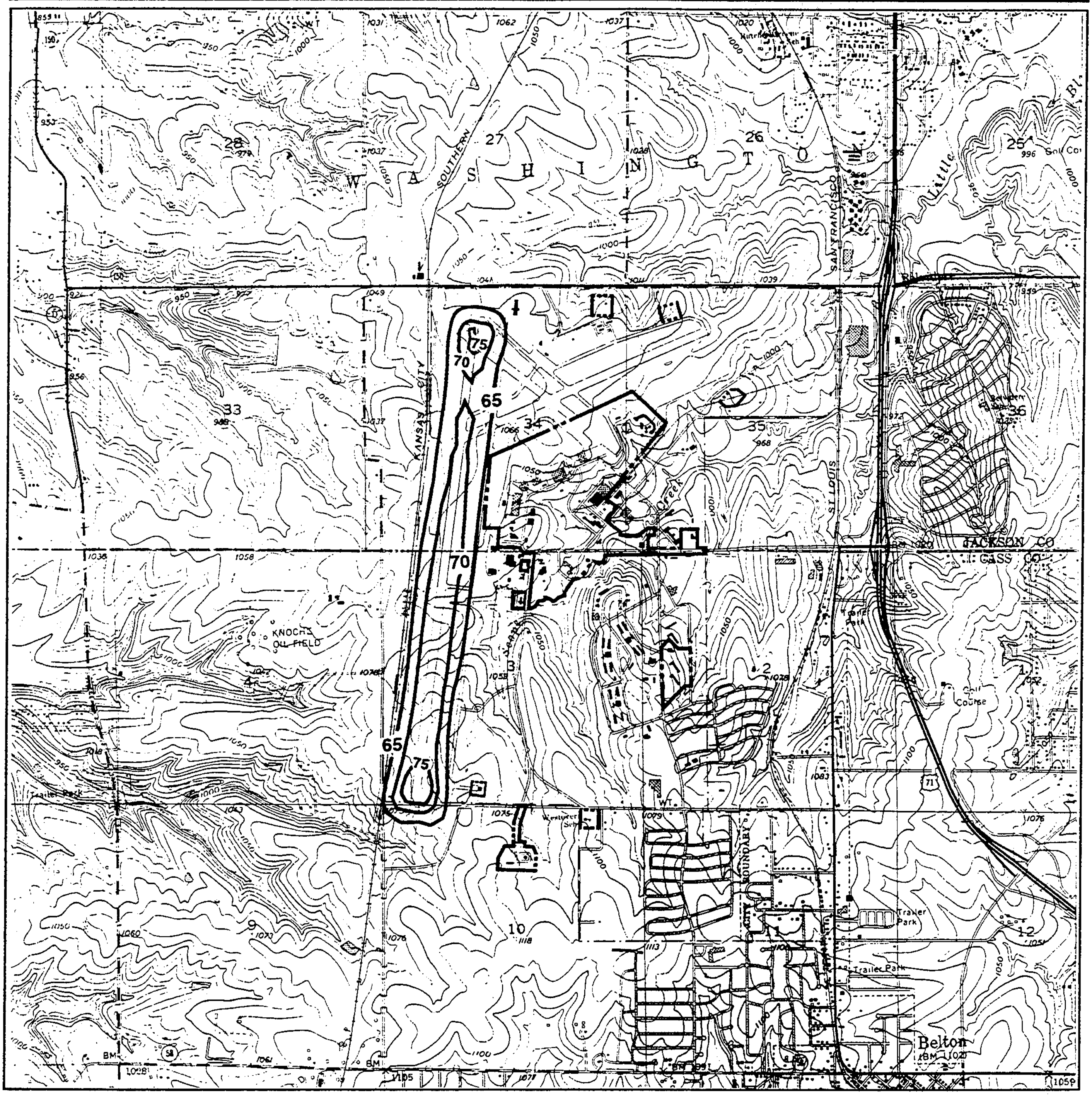
Map Source: U.S. Geological Survey, 1975.

Figure 3.4-4

Table 3.4-11. Distance to DNL from Roadway Centerline for the Preclosure Reference and Closure Baseline

Roadway Segment	DNL 65-70 dB Distance (feet)	DNL 65-70 dB No. of Residents	DNL 70-75 dB Distance (feet)	DNL 70-75 dB No. of Residents	DNL ≥75 dB Distance (feet)	DNL ≥75 dB No. of Residents	DNL 65-70 dB Distance (feet)	DNL 65-70 dB No. of Residents	DNL 70-75 dB Distance (feet)	DNL 70-75 dB No. of Residents	DNL ≥75 dB Distance (feet)	DNL ≥75 dB No. of Residents
	Preclosure						Closure					
M-58, US 71 to N Scott Avenue	120	0	50	0	30	0	120	0	50	0	30	0
M-150, Holmes Road to US 71	90	3	40	0	20	0	80	0	40	0	20	0
Andrews Road, M-150 to 155th Street	20	0	(a)	NA	(a)	NA	20	0	(a)	NA	(a)	NA
N Scott Avenue, M-58 to Markey Road	70	0	30	0	20	0	70	0	30	0	20	0
155th Street, US 71 Interchange	80	0	40	0	20	0	80	0	40	0	20	0
Markey Rd, N Scott Avenue to Westover Road	20	0	(a)	NA	(a)	NA	20	0	(a)	NA	(a)	NA
Westover Road, Markey Road to M-58	20	0	(a)	NA	(a)	NA	(a)	NA	(a)	NA	(a)	NA
Highway Y, M-58 to US 71	70	0	30	0	20	0	70	0	30	0	20	0
US 71, Highway Y to 155th Street	310	127	150	62	80	0	310	127	150	62	80	0

Note: (a) Contained within roadway.
dB = decibel.
DNL = day-night average sound level.
M = Missouri Highway.
NA = not applicable.
US = United States Highway.



EXPLANATION

— 65 — DNL Noise Contour (in 5 dB intervals)

- - - - Base Boundary

Closure Aircraft Noise Contours

0 750 1500 3000 Feet

Map Source: U.S. Geological Survey, 1975.

Figure 3.4-5

The projected surface traffic noise levels for the closure baseline were calculated using the surface traffic projections at base closure (Appendix I). The results of the modeling for the roadways analyzed are presented in Table 3.4-11. Again, the actual distances to the DNLs may be less than those presented in the table because the model does not account for screening effects of intervening buildings, terrain, and walls.

3.4.4.2 Noise-Sensitive Areas. No residences are within the DNL 65 dB or greater contours for preclosure aircraft operations at Richards-Gebaur Airport. Table 3.4-12 presents the approximate number of acres within each DNL range. As shown in this table, 679 acres were exposed to DNL 65 dB or greater in and around Richards-Gebaur Airport in 1992 as a result of military and civilian aircraft operations. Approximately 192 residents are estimated to have been exposed to DNL 65 dB or greater due to surface traffic in 1992, based on information in Table 3.4-11.

Table 3.4-12. DNL Exposure from Aircraft Operations - Preclosure and Closure

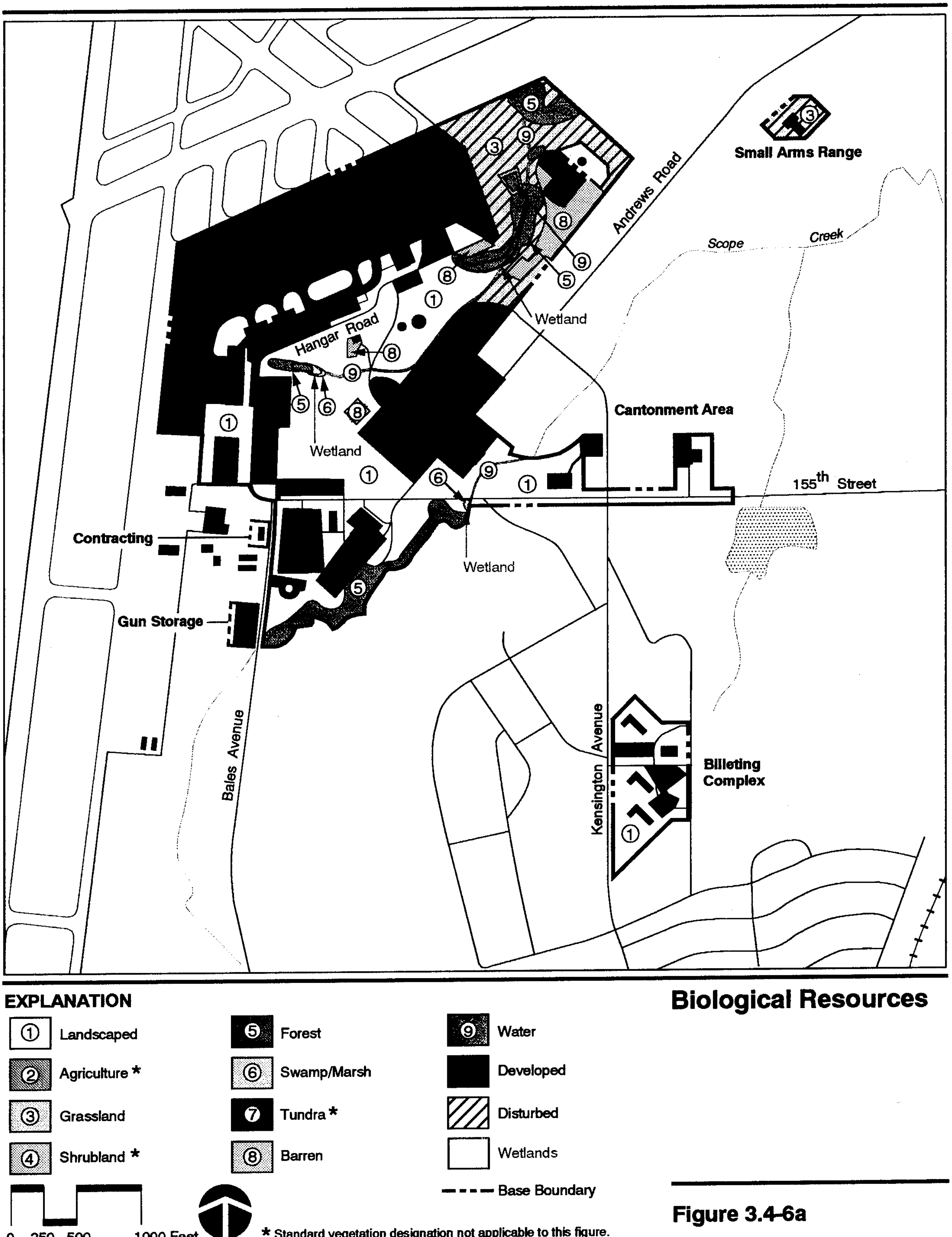
	Acres			
	65-70 dB	70-75 dB	Over 75 dB	Total ≥65 dB
Preclosure (1992)	363	156	160	679
Closure (1994)	147	113	11	271

dB = decibel.
DNL = day-night average sound level.

As shown in Table 3.4-12, a total of 271 acres will be exposed to DNL 65 dB or greater at closure in 1994 as a result of projected civilian aircraft operations at Richards-Gebaur Airport. Again, there are no residences within the DNL 65 dB or greater aircraft noise contours. Approximately 189 residents are estimated to be exposed to DNL 65 dB or greater due to surface traffic at closure, based on information in Table 3.4-11. Section 3.2.2, Land Use and Aesthetics, describes land uses on and near the base.

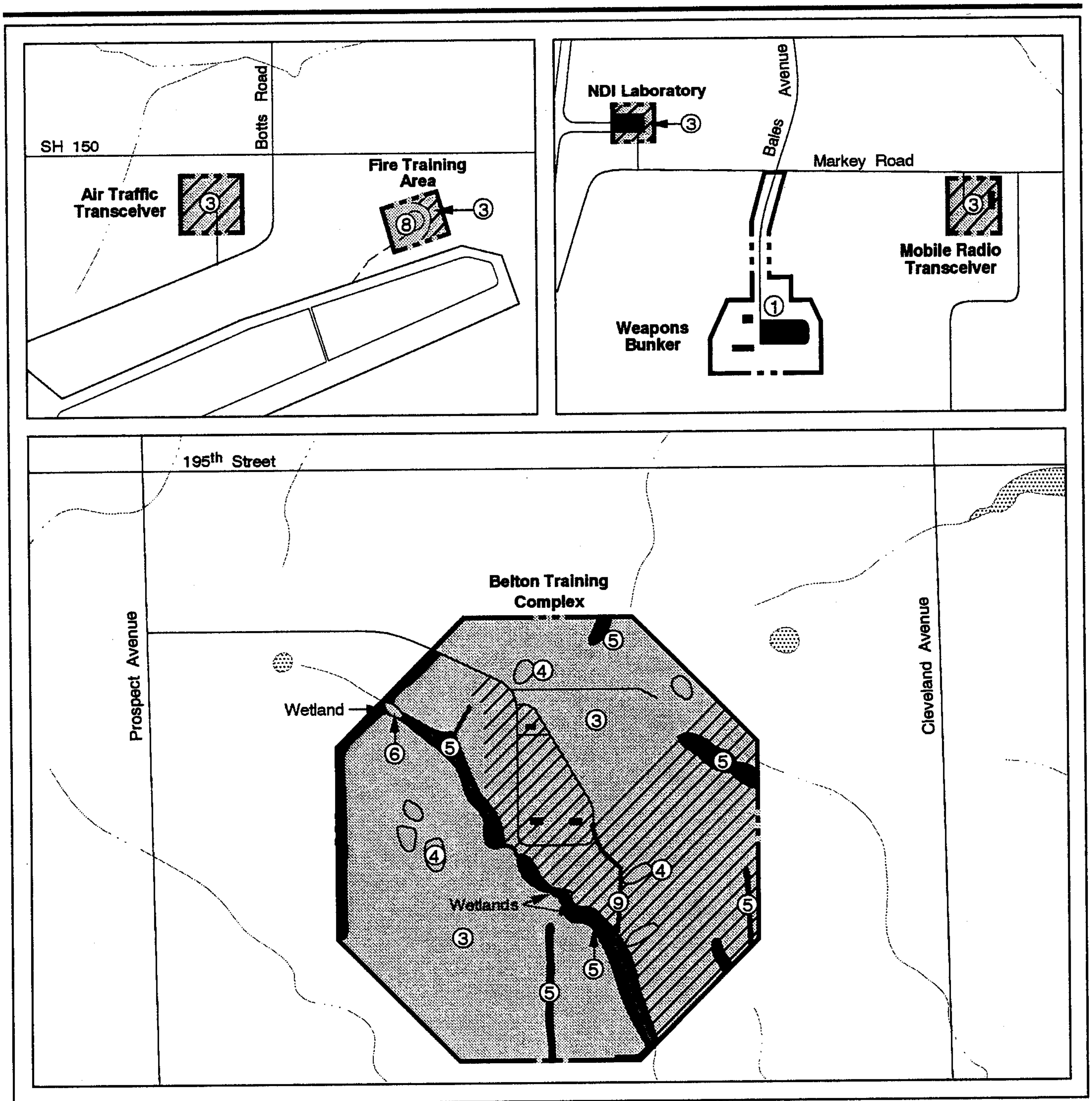
3.4.5 Biological Resources

Biological resources include the native and introduced plants and animals in the project area. For discussion purposes, these are divided into vegetation, wildlife (including aquatic biota), threatened and endangered species, and sensitive habitats. Data sources for biological resources include published literature, a field visit and reconnaissance survey in April 1993, and information provided by the U.S. Fish and Wildlife Service (USFWS) and Missouri Department of Conservation (MDC). Figures 3.4-6a and b depict



Biological Resources

Figure 3.4-6a



EXPLANATION

- ① Landscaped
- ② Agriculture *
- ③ Grassland
- ④ Shrubland
- ⑤ Forest
- ⑥ Swamp/Marsh
- ⑦ Tundra *
- ⑧ Barren
- ⑨ Water
- Developed
- Disturbed
- Wetlands
- Base Boundary

0 250 500 1000 Feet

* Standard vegetation designation not applicable to this figure.

Biological Resources

Figure 3.4-6b

the biological resources present on Richards-Gebaur AFB. A list of species that occur on and near the base is in Appendix H.

The ROI for biological resources at Richards-Gebaur AFB includes each parcel of Air Force property and surrounding adjacent habitats. This ROI includes the area within which potential direct and indirect impacts could occur and provides a basis for evaluating the level of impact.

3.4.5.1 Vegetation. Richards-Gebaur AFB is situated in a lowland region on the western edge of Missouri. Most of the region has been extensively altered by agricultural activities. Much of the natural vegetation on Richards-Gebaur AFB was formerly moist savanna, tall grass prairie, and lowland forest. Moist savannas are grassland areas with trees present along river bottoms. Typically, these areas are dominated by prairie grasses and herbs, and there are few shrubs, except for young trees. Under natural conditions, savannas are maintained by wildfires; however, with the settlement of man, the number of prairie/savanna fires has been reduced. The prairie has been further altered by landscaping and agricultural activities. Wooded and shrubby areas are now confined to drainage areas and fence lines where mowing and clearing activities are restricted (see Figures 3.4-6a and b). These disturbances currently maintain the vegetation on and around Richards-Gebaur AFB.

Most of the base parcels and surrounding areas are landscaped with fescues and bluegrass. Planted tree species include pin oak, honey locust, and blue spruce. Landscaped areas and disturbed grassland are maintained with herbicides, fertilizers, and mowing/pruning.

The wooded, riparian zones contain eastern cottonwood, honey locust, osage orange, and American elm. Wetland vegetation, including willow, cattails, and sedges, is present along drainages where water pools and where maintenance activities are precluded.

The Belton Training Complex is less disturbed than the other parcels (see Figure 3.4-6b), and contains a tall grass prairie community with moist savanna wooded areas. The tall grass vegetation includes big blue stem and Indian grass, with cord grass growing in the shallow, moist depressions. The entire Belton Training Complex has been mowed at some time, although the western side of the drainage has not been disturbed recently and has reverted to native prairie grassland. Riparian species as described above are also present along the drainages.

3.4.5.2 Wildlife. Richards-Gebaur AFB lies in a central lowland zone between the Great Plains prairie to the west and the forested Ozark highlands to the south and east. This area exhibits several habitats found in both of these communities, as well as habitats unique to central lowlands.

Extensive human activity, including agriculture and urbanization, has altered much of the natural habitat in the region. Several wide-ranging species that once inhabited the area are no longer found in central lowland habitats. Native elk and bison that roamed the great plains and savannas to the west, as well as mountain lion, black bear, and gray wolf that hunted throughout all habitats are no longer present. The white-tailed deer is the only large mammal to inhabit this area, and is preyed on by coyote, bobcat, man, and domestic dog.

Wildlife diversity and activity on base is greatest throughout the wooded areas. Typical mammals of these wooded habitats include both gray and red fox, raccoon, fox squirrel, eastern gray squirrel, eastern cottontail, and eastern mole. House mouse, opossum, and domestic dog and cat frequent landscaped and developed areas on base.

A variety of birds are found on base. Common grackle, tufted titmouse, mourning dove, yellow-rumped warbler, house finch, and downy woodpecker inhabit the wooded areas. Northern cardinal and black-capped chickadee are typical species associated with the fringes of wooded areas. Species associated with the open wetland habitats include red-winged blackbird and eastern phoebe. Typical species observed on landscaped areas include American robin, European starling, eastern meadowlark, and Canada goose. Killdeer utilize landscaped, standing water, and barren gravel areas on base. Common garter snake and racer are typical reptiles that inhabit all areas on base.

The flightline runoff detention reservoir may contain contaminants such as oils, fuels, and solvents. Although the reservoir is fenced, it still presents a potential hazard to birds and small rodents.

The less-disturbed Belton Training Complex includes several additional species typically associated with moist savanna and open tall grass prairie communities. White-tailed deer, great-horned owl, northern flicker, brown thrasher, and American tree sparrow are observed species associated with the wooded portions of this site. Northern bobwhite, a prairie species, was observed in the native tall grass. Remains of crayfish and ornate box turtle, a prairie species, were observed during the April 1993 survey.

3.4.5.3 Threatened and Endangered Species. USFWS has indicated that no federally listed threatened or endangered species (flora and fauna) are known to occur at Richards-Gebaur AFB (Appendix K). The MDC has conducted a natural features inventory in Jackson and Cass counties, which focused on listed plants and animals, and has indicated that no state-listed species are likely to occur on the base (Appendix K).

Limited populations of greater prairie chicken *(Tympunuchus cupido)*, a state-listed rare species, persist on native grasslands south and west of the

base. Richards-Gebaur AFB is located outside of the known prairie chicken ranges, and males were not observed during the April 1993 field survey, conducted in the courtship season. Therefore, the likelihood of this species occurring on base is low.

The auriculate false foxglove *(Agalinis auriculata)*, a candidate (Category 2) species for federal listing as threatened or endangered and listed as rare in Missouri, occurs on private land west of the base. The species can persist in areas with soil disturbance, and could be present on Richards-Gebaur AFB.

3.4.5.4 Sensitive Habitats. Wetlands are the only sensitive habitat at Richards-Gebaur AFB. Wetlands are defined as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (U.S. Army Corps of Engineers, 1987). The majority of jurisdictional wetlands in the United States meet three wetland delineation criteria (hydrophytic vegetation, hydric soils, and wetland hydrology) and are subject to Section 404 of the federal Clean Water Act. Areas that are periodically wet but do not meet all three criteria are not jurisdictional wetlands. Areas that have been disturbed or that are classified as problem area wetlands, however, may not meet all three criteria as a result of natural or man-induced reasons, yet are still considered wetlands. Wetlands present on Richards-Gebaur AFB meet the wetland delineation criteria.

There are 0.6 acre of wetlands in the Cantonment Area (see Figure 3.4-6a) and 0.2 acre in the Belton Training Complex (see Figure 3.4-6b). These wetland areas occur along the natural drainages that traverse the region.

The wetland in the central portion of the Cantonment Area is wooded with open patches of sedges and cattails. The wetland areas in the northeastern portion of the Cantonment Area are dominated by cattails with intermittent patches of black willow where surface flow is reduced. The wetland areas filter the water that passes through them, settling out sediments and slowing the velocity of storm water runoff that could otherwise erode the drainage channels during periods of high flow. The vegetation within the drainages in the Cantonment Area has been left fairly natural for these reasons, even though the surrounding areas have been landscaped. Redwing blackbirds were observed nesting along the wetlands.

The vegetation in the wetland areas in the Belton Training Complex is similar to that in the Cantonment Area wetland areas, which is predominantly cattails, honey locust, and cottonwoods. The wetlands in the Belton Training Complex are wooded and support more wildlife species than the wetlands in the Cantonment Area.

3.4.6 Cultural Resources

Cultural resources are prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious or other reasons. Cultural resources have been divided, for ease of discussion, into three main categories: prehistoric resources, historic resources and structures, and traditional resources. These types of resources are defined in Appendix E. For the purposes of this analysis, paleontological resources, the fossil evidence of past plant and animal life, have been included within the cultural resources category.

For this analysis, the cultural resources ROI is synonymous with the area of potential effect (APE) as defined by regulations implementing the National Historic Preservation Act (NHPA) (16 U.S.C. §§470f). At Richards-Gebaur AFB, the ROI includes all areas within the base boundary.

The conveyance of federal property to a private party or non-federal agency constitutes an undertaking, or a project that falls under the requirements of cultural resources legislative mandates. Any historic properties located on that property would then cease to be protected by federal law. However, impacts resulting from conveyance could be mitigated by placing preservation covenants on the lease or disposal document. Reuse activities within designated parcels would require the reuser to comply with the requirements contained in the preservation covenants.

Numerous laws and regulations require federal agencies to consider the effects of a proposed project on cultural resources. These laws and regulations stipulate a process for compliance, define the responsibilities of the federal agency proposing the action, and prescribe the relationship among other involved agencies (e.g., the State Historic Preservation Office, the Advisory Council on Historic Preservation). Methods used to achieve compliance with these requirements are presented in Appendix E.

Only those potential historic properties determined to be significant under cultural resources legislation are subject to protection or consideration by a federal agency. The quality of significance, in terms of integrity and applicability to National Register of Historic Places (National Register) criteria, is discussed in Appendix E. Significant cultural resources, either prehistoric or historic in age, are referred to as "historic properties".

In compliance with the NHPA, the Air Force has initiated the Section 106 review process with the Missouri State Historic Preservation Officer (SHPO). In April 1993, record and literature searches were performed using environmental and cultural resources documents from the SHPO's office and Richards-Gebaur AFB. Results are discussed under the appropriate resource category.

3.4.6.1 Prehistoric Resources. The physiography and climate of west-central Missouri have supported a cultural resources chronology that extends into the past for over 14,000 years. One of the earliest known recorded archaeological sites in North America (dated to approximately 12,000 years ago), is the Shriver site located north of Kansas City in Daviess County (Jennings, 1978). Five major periods of prehistory, indicative of various technological, exploitative, and settlement patterns are represented in the region: the Paleo-Indian Period (12000-8000 B.C.), the Dalton Period (8000-7000 B.C.), the Archaic Period (7000-1000 B.C.), the Woodland Period (1000 B.C.-A.D. 900), and the Mississippian Period (A.D. 900-1700) (Environmental Systems Analysis, 1983).

At the time of European contact in the early 1700s, the Osage, Kansa, and Missouri Indian tribes inhabited the region. However, by 1890 all Indian land had been either ceded to the United States through treaties with the Osage and Kansa tribes or lost through legal or political actions.

Archaeological surveys of the installation include a 1977 survey performed by the Air Force and the U.S. Army Corps of Engineers (Corps); a 1979 survey by the Corps of a military housing project, the golf course area, and land adjacent to the runways; and a comprehensive 1982 cultural resources investigation (which also included a historic building/structures survey) of the entire installation (including the Belton Training Complex) by a private consulting firm. The 1982 study was performed in support of the decision to close the base and retain only a small portion for the Air Force Reserve, and resulted in the preparation of a cultural resources management inventory (Environmental Systems Analysis, 1983).

The 1977 and 1979 surveys concluded that there were no prehistoric archaeological sites of significance identified on Richards-Gebaur AFB. Both surveys were coordinated with the Missouri SHPO and the Eastern Division of the Advisory Council on Historic Preservation (U.S. Air Force, 1981). The Missouri SHPO has been consulted regarding the status of archaeological resources at Richards-Gebaur AFB and has concurred that disposal and reuse would have no effect.

3.4.6.2 Historic Structures and Resources. The Richards-Gebaur AFB region was initially settled and controlled by the French and Spanish, but after Missouri was admitted to the Union in 1820, farmers from the upper southern states began to settle in the area (Environmental Systems Analysis, 1983). The railroad was completed to Belton and Grandview in the late 1800s and Grandview AFB, later named Richards-Gebaur AFB, was built in 1951. The 1982 cultural resources investigations identified one historic archaeological site (23CS102, a 1926 single-family residence) that was not recommended as eligible to the National Register. Site 23CS102 is located near the south end of the runway in an area that was excessed during the earlier closure action and is no longer under Air Force ownership. The

Missouri SHPO has agreed that disposal and reuse of the base will have no effect on archaeological resources. In 1982, over 100 buildings and structures were listed on the Richards-Gebaur AFB real property inventory detail list, and all were evaluated in the 1982 cultural resources management inventory. Of these, 17 were recommended as potentially eligible to the National Register, and are described as follows:

- 11 quonset huts potentially eligible as a thematic group (Facility numbers 128, 129, 805, 923, 1022, 1107, and 1234-1238

- The Semi-Automatic Ground Environment (SAGE) complex (Facility numbers 611, 612, 6110, and 6111) and two headquarters buildings (Facility numbers 100 and 602) potentially eligible as an air defense headquarters Historic District.

As a result of the earlier disposal action, only 2 of the 17 recommended buildings (Building 602, built in 1956, and Building 923, built in 1961) currently remain under Air Force ownership; the remainder have been excessed or demolished.

A review of real property records in April 1993 indicates that the remaining built environment within the APE at Richards-Gebaur AFB consists of approximately 83 buildings and structures (U.S. Air Force, 1993b); of these, none, including Buildings 602 and 923, have yet attained the age of 50 years. In addition, most of the facilities have undergone modifications that have significantly altered their exterior character-defining qualities. Visual inspection of all of the facilities at the installation reveals that none demonstrate remarkable architectural style or distinctive characteristics of a type, period, or method of construction. Historical research, including interviews with the base historian and other individuals familiar with the history of the installation, preliminarily indicates that only one building, Building 602, is associated with events or persons significant in the past and the Missouri SHPO has determined that this building is potentially eligible to the National Register (Appendix K). Building 923 does not demonstrate sufficient significance or integrity to be determined eligible on individual merit and the SHPO has concurred (Appendix K). The boundary of the 1982 proposed Historic District is no longer intact, because all of the buildings (except Building 602) considered to be potentially eligible at that time were excessed or demolished as a part of the earlier disposal action.

3.4.6.3 Traditional Resources. Traditional resources can include archaeological sites, burial sites, ceremonial areas, caves, mountains, water sources, plant habitat or gathering areas, or any other natural area important to a culture for religious or heritage reasons. Significant traditional sites are subject to the same regulations, and afforded the same protection as other types of historic properties. Any modern traditional resources at

Richards-Gebaur AFB would be associated with the Osage, Kansa, or Missouri Indian tribes; however, no such resources have been identified.

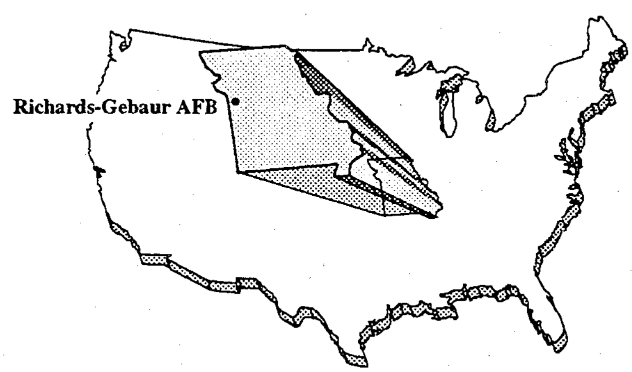
To ensure that any Native American concerns relating to the disposal and reuse of Richards-Gebaur AFB are adequately considered, consultation with the Heart of America Indian Center in Kansas City has been initiated (Appendix K).

3.4.6.4 Paleontological Resources. As described in Section 3.4.1.1, the geologic units in the Richards-Gebaur AFB include thin surface layers of residuum (weathered bedrock) and loess (wind-blown silt) overlying a stratigraphic sequence of Paleozoic Era sedimentary rocks, which rest on Precambrian granitic bedrock (Gentile, 1984).

No animal (vertebrate or invertebrate) or plant fossils are known from the surface residuum and loess on or near Richards-Gebaur AFB. Fossil identification from rock units studied in areas near Richards-Gebaur AFB can be extrapolated to identify the probable content of fossils beneath the base. Individual rock units within the approximately 2,500 feet of Paleozoic rocks underlying Richards-Gebaur AFB contain numerous types of marine invertebrate fossils, fossil algae, wood fragments, root impressions, trace fossils, and associated fossils (Gentile, 1976; 1984; Missouri Division of Geological Survey and Water Resources, 1961).

The utility and value of the paleozoic fossil resources at Richards-Gebaur AFB are very limited because the only known fossils found near the surface on the base are carbonized wood fragments; the remainder are expected to occur at depth, rather than at the surface. Also, the fossils are common to the rocks of the region and are not unique to the site; as a result, these fossils can be retrieved and studied much more easily in other locations.

The base contains no known important fossil localities; no lands are set aside for fossil preservation (e.g., state or national fossil parks), and there are no National Natural Landmarks within the area.



CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter discusses the potential environmental consequences associated with the Proposed Action and alternatives. To provide the context in which potential environmental impacts may occur, discussions of potential changes to the local communities, including population, land use and aesthetics, transportation, and community and public utility services are included in this EIS. In addition, issues related to current and future management of hazardous materials and wastes are discussed. Impacts to the physical and natural environment are evaluated for geology and soils, water resources, air quality, noise, biological resources, and cultural resources. These impacts may occur as a direct result of disposal and reuse activities or as an indirect result caused by changes within the local communities. Possible mitigation measures to minimize or eliminate the adverse environmental impacts are also presented.

Cumulative impacts result from "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (Council on Environmental Quality, 1978). Cumulative impacts are discussed, as appropriate, by resource in this chapter.

Because the airfield is owned by the KCAD and is not part of Air Force property to be disposed, civilian operations at Richards-Gebaur Airport would continue under the No-Action Alternative. It is assumed that only the main runway would be used, as under preclosure and closure conditions. Civilian aircraft activity levels are expected to be similar to those projected at closure, and would probably increase over the next 20 years as a result of general growth in the region, even without the addition of Air Force property. Further, it would be difficult to project the difference in aviation operations growth with and without base disposal and reuse. For these reasons, and because the Air Force contribution to aviation operations (and associated environmental impacts) at Richards-Gebaur Airport has been small, it has been assumed for the purposes of this environmental analysis that all growth is associated with reuse, and impacts are analyzed for total (cumulative) projected aviation activities developed for the Proposed Action and reasonable reuse scenarios described in Chapter 2.

Means of mitigating adverse environmental impacts that may result from implementation of the reuse alternatives by property recipients are discussed. Mitigation measures are suggested for those components likely to experience substantial and adverse changes under any or all of these

alternatives. Potential mitigation measures depend upon the particular resource affected. In general, however, mitigation measures are defined in CEQ regulations as actions that include:

(a) Avoiding the impact altogether by not taking an action or certain aspect of the action

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action

(e) Compensating for the impact by replacing or providing substitute resources or environments.

A discussion of the effectiveness of mitigation measures is included for those resource areas where it is applicable. Where appropriate, a discussion regarding the probability of success associated with a particular mitigation is included.

Since most potential environmental impacts would result directly from reuse by others, the Air Force would not typically be responsible for implementing such mitigations. Full responsibility for these suggested mitigations, therefore, would be borne primarily by future property recipients or local government agencies.

Alternatives are defined for this analysis on the basis of (1) plans of local communities and interested individuals, (2) general land use planning considerations, and (3) Air Force-generated plans to provide a broad range of reuse options. Reuse scenarios considered in this EIS must be sufficiently detailed to permit environmental analysis. Initial concepts and plans are taken as starting points for scenarios to be analyzed. Available information on any reuse alternative is then supplemented with economic, demographic, transportation, and other planning data to provide a reuse scenario for analysis.

4.2 LOCAL COMMUNITY

This section discusses potential effects on local communities as a result of disposal and reuse of Richards-Gebaur AFB.

4.2.1 Community Setting

Socioeconomic effects will be addressed only to the extent that they are interrelated with the biophysical environment. A complete assessment of socioeconomic effects is presented in the Socioeconomic Impact Analysis Study Disposal and Reuse of Richards-Gebaur Air Force Base, Missouri. The following discussion is limited to key employment and population effects of the Proposed Action and three reuse alternatives in comparison to projected conditions under the No-Action Alternative.

This analysis recognizes the potential for community impacts arising from "announcement effects" stemming from information regarding the base's closure or reuse. Such announcements may impact community perceptions and, in turn, could have important local economic effects. An example would be the in-migration of people anticipating employment under one of the reuse options. If it were later announced that the No-Action Alternative was chosen, many of the newcomers would leave the area to seek employment elsewhere. Such an effect could, therefore, result in an initial, temporary increase in population followed by a decline in population as people leave the area. Changes associated with announcement effects, while potentially important, are highly unpredictable and difficult to quantify; therefore, such effects are excluded from the quantitative analysis in this study, and are not included in numeric data presented in this report.

4.2.1.1 Proposed Action. Under the Proposed Action, employment in Jackson and Cass counties would increase from 482,927 in 1994 to 508,102 in 2014, compared to a projected employment in the ROI of 505,102 in 2014 without reuse (Table 4.2-1). This projected reuse-related employment would represent an increase of less than 1 percent from projections without reuse. Most of the jobs generated by base reuse would be taken by workers already in the ROI; in-migration is estimated to be less than 3 percent of the reuse-related employment. Effects on total ROI employment associated with reuse of Richards-Gebaur AFB under the Proposed Action, which represents the change from projected No-Action Alternative conditions for the same year, would be negligible (Table 4.2-2).

Table 4.2-1. Total ROI Employment (Including Reuse)

Alternative	1999	2004	2014
Proposed Action[a]	501,721	511,282	508,102
Aviation	502,323	511,596	507,040
Aviation with Mixed Use	502,180	511,520	507,513
Industrial	501,553	511,012	507,019
No-Action	500,680	509,589	505,102

Note: (a) Employment has been adjusted to account for the 45 U.S. Marine Corps-related jobs that would remain within the ROI but would be relocated to the site.

Table 4.2-2. Reuse-Related Employment Effects

Alternative	1994	1999	2004	2014
Proposed Action	11	1,086	1,738	3,045
Aviation	11	1,643	2,007	1,938
Aviation with Mixed Use	11	1,500	1,931	2,411
Industrial	11	873	1,423	1,917

Note: Values shown are increases from No-Action Alternative conditions.

Reuse under the Proposed Action would result in little population in-migration (Table 4.2-3); population is projected to increase from 705,923 persons in 1994 to 734,441 in 2014, compared to a projected population of 734,216 in 2014 without reuse. Population effects from reuse would represent an increase of less than 1 percent from projections without reuse (Table 4.2-4).

Table 4.2-3. Total ROI Population (Including Reuse)

Alternative	1999	2004	2014
Proposed Action	716,819	723,365	734,441
Aviation	716,898	723,418	734,382
Aviation with Mixed Use	716,883	723,406	734,414
Industrial	716,831	723,365	734,376
No-Action	716,761	723,249	734,216

Table 4.2-4. Reuse-Related Population Effects

Alternative	1994	1999	2004	2014
Proposed Action	0	58	116	225
Aviation	0	137	169	166
Aviation with Mixed Use	0	122	157	198
Industrial	0	70	116	160

Note: Values shown are increases from No-Action Alternative conditions.

4.2.1.2 Aviation Alternative. Employment and population effects under the Aviation Alternative would be similar to those discussed for the Proposed Action. Employment in Jackson and Cass counties would increase from 482,927 in 1994 to 507,040 in 2014, compared to a projected employment in the ROI of 505,102 in 2014 without reuse (see Table 4.2-1). This projected reuse-related employment would represent an increase of less than 1 percent from projections without reuse. Most of the jobs generated by base

reuse would be taken by workers already in the ROI; in-migration is estimated to be less than 3 percent of the reuse-related employment. Effects on total ROI employment associated with reuse of Richards-Gebaur AFB under the Aviation Alternative, which represents the change from projected No-Action Alternative conditions for the same year, would be negligible (see Table 4.2-2).

Reuse under the Aviation Alternative would result in little population in-migration (see Table 4.2-3); population is projected to increase from 705,923 in 1994 to 734,382 in 2014, compared to a projected population of 734,216 in 2014 without reuse. Population effects from reuse would represent an increase of less than 1 percent from projections without reuse (see Table 4.2-4).

4.2.1.3 Aviation with Mixed Use Alternative. Employment and population effects under the Aviation with Mixed Use Alternative would be similar to those discussed for the Proposed Action. Employment in Jackson and Cass counties would increase from 482,927 in 1994 to 507,513 in 2014, compared to a projected employment in the ROI of 505,102 in 2014 without reuse (see Table 4.2-1). This projected reuse-related employment would represent an increase of less than 1 percent from projections without reuse. Most of the jobs generated by base reuse would be taken by workers already in the ROI; in-migration is estimated to be less than 3 percent of the reuse-related employment. Effects on total ROI employment associated with reuse of Richards-Gebaur AFB under the Aviation with Mixed Use Alternative would be negligible (see Table 4.2-2).

Reuse under the Aviation with Mixed Use Alternative would result in little population in-migration (see Table 4.2-3); population is projected to increase from 705,923 in 1994 to 734,414 in 2014, compared to a projected population of 734,216 in 2014 without reuse. Population effects from reuse would represent an increase of less than 1 percent from projections without reuse (see Table 4.2-4).

4.2.1.4 Industrial Alternative. Employment and population effects under the Industrial Alternative would be similar to those discussed for the Proposed Action. Employment in Jackson and Cass counties would increase from 482,927 in 1994 to 507,019 in 2014, compared to a projected employment in the ROI of 505,102 in 2014 without reuse (see Table 4.2-1). This projected reuse-related employment would represent an increase of less than 1 percent from projections without reuse. Most of the jobs generated by base reuse would be taken by workers already in the ROI; in-migration is estimated to be less than 3 percent of the reuse-related employment. Effects on total ROI employment associated with reuse of Richards-Gebaur AFB under the Industrial Alternative would be negligible (see Table 4.2-2).

Reuse under the Industrial Alternative would result in little population in-migration (see Table 4.2-3); population is projected to increase from 705,923 in 1994 to 734,376 in 2014, compared to a projected population of 734,216 in 2014 without reuse. Population effects from reuse would represent an increase of less than 1 percent from projections without reuse (see Table 4.2-4).

4.2.1.5 No-Action Alternative. Under the No-Action Alternative, baseline economic growth in Jackson and Cass counties would result in a projected increase in employment from 482,927 at closure (1994) to 505,102 in 2014 (see Table 4.2-1). Population in the two-county ROI is projected to increase from 705,923 in 1994 to 734,216 in 2014 without reuse (see Table 4.2-3).

4.2.2 Land Use and Aesthetics

This section discusses the alternatives relative to land use and zoning to determine potential impacts in terms of comprehensive plans, zoning, land use, and aesthetics. Land use compatibility with aircraft noise is discussed in Section 4.4.4.

4.2.2.1 Proposed Action

Comprehensive Plans. The current comprehensive plans for Kansas City, Belton, and Cass County generally provide for the redevelopment of Richards-Gebaur AFB. Kansas City plans to update its comprehensive plan (i.e., Master Plan for Development of Non-Aviation Property at Richards-Gebaur AFB) to reflect redevelopment plans for the base property. Cass County and Belton would not need to update their comprehensive plans. Kansas City has procedures in place for revising its plan, and this administrative change is not expected to impact the goals and objectives of reuse.

Zoning. The zoning ordinances of Kansas City, Belton, and Cass County would be applicable when the base property is conveyed to private ownership. Kansas City has not zoned the portion of the Cantonment Area south of 155th Street, the Billeting Complex, and the NDI Laboratory within its jurisdiction. These areas would have to be zoned to accommodate the proposed uses. The office/industrial park (OIP) land use proposed for the Weapons Bunker and Mobile Radio Transceiver within Belton would not be allowed in the current agricultural zoning designation.

Land Use. The Proposed Action would result in several changes to land use patterns on base property (Table 4.2-5). The aviation support and industrial acreages would increase from preclosure under the Proposed Action; commercial acreage would decrease; and the institutional, residential, public facilities/recreation, and vacant land uses would be eliminated. In addition, new OIP and military land uses would be created. The proposed land uses are generally consistent with both existing and anticipated land uses

Table 4.2-5. Land Use Changes from Preclosure

Land Use	Preclosure Acreage	Changes in Acreage: Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative
Aviation Support	85	+3	+30	-6	-60
Industrial	45	+12	+39	+55	+80
Office/Industrial Park	0	+45	0	0	0
Institutional					
Medical	6	-6	-6	-6	+10
Educational	184	-184	-184	-171	-138
Commercial	26	-21	-26	-4	-20
Residential	9	-9	+188	-9	+10
Public Facilities/Recreation	19	-19	+11	+193	-14
Agriculture	0	0	0	0	+184
Military	0	+231	0	0	0
Vacant Land	52	-52	-52	-52	-52

surrounding the base. The restrictive safety easements associated with the Small Arms Range and Weapons Bunker would be removed, thus allowing for development of this land.

Aesthetics. Under the Proposed Action, areas in the Cantonment Area exhibiting a high visual sensitivity would be kept as open space in the military use areas, and would remain unchanged from closure baseline conditions. The areas of high visual sensitivity in the Belton Training Complex would also remain as they are, since the existing training use would continue.

4.2.2.2 Aviation Alternative

Comprehensive Plans. The land uses proposed under the Aviation Alternative are generally consistent with the comprehensive plans for the local communities. The only anticipated change would be to Cass County's comprehensive plan, which does not presently allow for residential development in the Belton Training Complex area. Cass County has procedures in place for revising its plan, and this administrative change is not expected to impact the goals and objectives of reuse.

Zoning. Kansas City has not zoned the portion of the Cantonment Area south of 155th Street, the Billeting Complex, and the NDI Laboratory within its jurisdiction. These areas would have to be zoned to accommodate the proposed uses. The industrial land use proposed for the Weapons Bunker and Mobile Radio Transceiver within Belton and the proposed residential use

at the Belton Training Complex (at a density of one dwelling unit per 3 acres) would not be allowed in current agricultural zoning designations.

Land Use. The Aviation Alternative would result in several changes to land use patterns on base property (see Table 4.2-5). The aviation support, industrial, residential, and public facilities/recreation areas would increase from preclosure under the Aviation Alternative, whereas the institutional, commercial, and vacant land uses would be eliminated. The proposed land uses are generally consistent with both existing and anticipated land uses surrounding the base. The restrictive safety easements associated with the Small Arms Range, Weapons Bunker, and Belton Training Complex would be removed, thus allowing for development of this land.

Aesthetics. Under the Aviation Alternative, areas in the Cantonment Area exhibiting a high visual sensitivity would be used for public facilities/ recreation, and would remain unchanged from closure baseline conditions. The areas of high visual sensitivity in the Belton Training Complex would be incorporated as open areas within the residential development, because the topography is not readily suitable for construction.

4.2.2.3 Aviation with Mixed Use Alternative

Comprehensive Plans. The land uses proposed under the Aviation with Mixed Use Alternative are generally consistent with the comprehensive plans for the local communities. However, Kansas City's comprehensive plan does not reflect the commercial and institutional (educational) uses proposed for areas south of 155th Street, and Belton's comprehensive plan does not reflect public facilities/recreation use of the Weapons Bunker and Mobile Radio Transceiver. These communities have procedures in place for revising these plans, and these administrative changes are not expected to impact the goals and objectives of reuse.

Zoning. The portion of the Cantonment Area south of 155th Street, the Billeting Complex, and NDI Laboratory within Kansas City have not been zoned, and would need to be zoned to accommodate the proposed uses. The public facilities/recreation use proposed for the Weapons Bunker and Mobile Radio Transceiver and the regional park proposed for the Belton Training Complex would be consistent with the agricultural zoning designations.

Land Use. The Aviation with Mixed Use Alternative would result in several changes to the land use patterns on base property (see Table 4.2-5). The aviation support, institutional (educational), and commercial land uses would decrease in area from preclosure, whereas the industrial and public facilities/recreation uses would increase. Institutional (medical), residential, and vacant land uses would be eliminated. The proposed land uses would generally be compatible with both existing and proposed adjacent land uses.

The restrictive safety easements associated with the Weapons Bunker and Belton Training Complex would be removed, thus allowing for development of this land. The safety easement adjacent to the reused Small Arms Range would be retained to support reuse of that facility by local law enforcement agencies.

Aesthetics. Under the Aviation with Mixed Use Alternative, areas in the Cantonment Area exhibiting a high visual sensitivity would be unaffected because no development is proposed along the wooded drainages in the public facilities/recreation and commercial land uses. The visually sensitive characteristics of the Belton Training Complex would be preserved under reuse as a park.

4.2.2.4 Industrial Alternative

Comprehensive Plans. Kansas City's comprehensive plan does not include institutional (medical and educational) uses in the Cantonment Area, and Belton's comprehensive plan does not include residential use of the Weapons Bunker and Mobile Radio Transceiver. Reuse of the Belton Training Complex for agricultural purposes would be consistent with the Cass County comprehensive plan. These communities have procedures in place for revising these plans, and these administrative changes are not expected to impact the goals and objectives of reuse.

Zoning. The portion of the Cantonment Area south of 155th Street within Kansas City is currently not zoned, and would need to be zoned to accommodate the proposed uses. In addition, the Cantonment Area north of 155th Street within Kansas City is zoned industrial and does not provide for the proposed medical component of the institutional land use; however, it does allow transportation-related activities, including training (Kansas City, 1988b), so the proposed educational use would be allowed. Current agricultural zoning in Belton does not allow for the proposed residential density of five dwelling units per acre at the Weapons Bunker and Mobile Radio Transceiver. Agricultural use of the Belton Training Complex would be consistent with the agricultural zoning designation.

Land Use. The Industrial Alternative would result in several changes to the land use patterns on Richards-Gebaur AFB (see Table 4.2-5). Aviation support, institutional (educational), commercial, and public facilities/recreation land uses would decrease in area from preclosure, whereas the industrial, institutional (medical), and residential areas would increase. Vacant land would be eliminated and an agricultural land use would be created at the Belton Training Complex. The proposed land uses would be generally compatible with existing and proposed adjacent land uses. The restrictive safety easements associated with the Small Arms Range, Weapons Bunker, and Belton Training Complex would be removed, thus allowing for development of this land.

Aesthetics. Under the Industrial Alternative, areas in the Cantonment Area exhibiting a high visual sensitivity would be unaffected by reuse as institutional (medical and educational) land uses because no development is proposed along the wooded drainages. The conversion of the Belton Training Complex to agricultural land uses would ensure continued integration of the site into the surrounding rural landscape.

4.2.2.5 No-Action Alternative

Land Use. The No-Action Alternative would cause no physical changes in on-base land use from conditions at closure.

Aesthetics. Minimal change to the visual and aesthetic quality of base property and the surrounding areas would occur under the No-Action Alternative. Some landscaped areas would receive less intensive maintenance and would be allowed to revert to a more natural condition.

4.2.3 Transportation

The effects of the Proposed Action and alternatives on each component of the transportation system, including roadways, airspace and air traffic, and other modes of transportation, are presented in this section. Possible mitigation measures are identified for those components likely to experience substantial impacts under any alternative.

Roadways. Reuse-related effects on roadway traffic were assessed by estimating the number of trips generated by each land use considering employees, visitors, residents, and service vehicles associated with construction and all other on-site activities for each alternative. Principal trip-generating land uses include industrial, office, commercial, residential, and airport uses. The distribution of trips to and from the site is based on existing travel patterns. Peak hour volumes for the afternoon period were generated and added to the closure peak hour volumes on the key roadway links in the ROI.

Traffic impacts were determined based on the LOS changes for each of the key roadways as a result of site-generated traffic compared to the traffic expected as a result of general growth in the Kansas City region (No-Action Alternative). These analyses reflect the impact of planned roadway improvements to widen M-58, M-150, and North Scott Avenue from two to four lanes by 1999.

Airspace/Air Traffic. The airspace analysis performed by the Air Force for purposes of this EIS examines the type and level of aircraft operations projected for the reuse alternatives and compares them to airspace configuration and use under the preclosure reference. The impact analysis considers the relationship of the projected aircraft operations to the

operational capacity of the airport, using criteria that have been established by the FAA for determining airport service volumes. Potential effects on airspace use were assessed, based on the extent to which the reuse alternatives could (1) require modifications to the airspace structure or air traffic control systems and/or facilities; (2) restrict, limit, or otherwise delay other air traffic in the region; or (3) encroach on other airspace areas and uses.

The FAA is ultimately responsible for evaluating the specific effects that the reuse of an airport will have on the safe and efficient use of navigable airspace by aircraft. Such a study is based on details from the airport proponent's ALP and consists of a formal airspace analysis, a flight safety review, and a review of the potential effect of the proposal on air traffic control and air navigational facilities. Once this study is completed, the FAA can then determine the actual requirements for facilities, terminal and en route airspace, and instrument flight procedures.

Other Transportation Modes. Because none of the alternatives assumes direct use of the local railroad, direct effects on rail transportation are expected to be minimal.

4.2.3.1 Proposed Action

Roadways. The ADT distributed on key local roadways for each alternative is shown in Table 4.2-6. Table 4.2-7 identifies the peak hour traffic volumes expected from the Proposed Action and all reuse alternatives on key regional and local roadways.

Table 4.2-6. Average Daily Traffic

Alternative	1999	2004	2014
Proposed Action	1,700	2,900	5,300
Aviation	2,800	3,650	3,850
Aviation with Mixed Use	4,000	4,600	5,300
Industrial	2,050	3,300	3,950

Note: Values represent average weekday trips. All numbers have been rounded to the nearest 50.

As described in Section 2.2.8, under the Proposed Action, three new roads would be constructed to improve traffic circulation within the airport boundary. In addition, all roads within the airport boundary would be widened to 36 feet.

The largest number of trips would be added to M-150 and Andrews Road. These roads would experience an increase of 250 vehicles during the peak hour from projected conditions under the No-Action Alternative.

Table 4.2-7. Peak Hour Traffic Volumes in 2014

			Closure (1994)		Proposed Action-2014		Aviation Alternative-2014		Aviation with Mixed Use Alternative - 2014		Industrial Alternative - 2014		No-Action Alternative - 2014	
Roadway	Segment	Capacity	Peak Hour Volume	LOS	Peak Hour Volume	LOS	Peak Hour Volume	LOS	Peak Hour Volume	LOS	Peak Hour Volume	LOS	Peak Hour Volume	LOS
M-58	US 71 to N Scott Avenue	1,400[a]	1,700	F	1,900	D	1,900	D	1,900	D	1,900	D	1,850	D
M-150	Holmes Road to US 71	1,700[a]	900	E	2,300	E	2,250	E	2,350	E	2,250	E	2,050	E
Andrews Road	M-150 to 155th Street	1,500	100	B	400	C	350	C	400	C	350	C	150	B
N Scott Avenue	M-58 to Markey Road	1,500[a]	1,150	E	1,300	C	1,300	C	1,300	C	1,300	C	1,250	B
155th Street	US 71 Interchange	1,400	1,400	F	1,700	F	1,650	F	1,700	F	1,650	F	1,550	F
Markey Road	N Scott Avenue to Westover Road	1,550	350	C	400	D	400	D	400	D	400	D	400	D
Westover Road	Markey Road to M-58	1,500	150	C	250	C	250	C	250	C	250	C	200	C
Highway Y	M-58 to US 71	1,700	700	D	750	D	750	D	750	D	750	D	750	D
US 71	Highway Y to 155th Street	5,550	2,750	C	4,150	D	4,150	D	4,150	D	4,150	D	4,100	D

Notes: All values have been rounded to the nearest 50.
(a) Planned improvements would increase capacity to 2,750 by 1999.
LOS = level of service.

Approximately 150 vehicles would be added to 155th Street and 50 vehicles would be added to M-58, North Scott Avenue, Westover Road, and U.S. 71 during the peak hour. Increases on Markey Road and Highway Y would be less than 50 vehicles each.

It is expected that 155th Street at the U.S. 71 interchange would operate at LOS F and M-150 from Holmes Road to U.S. 71 would operate at LOS E by 2014. However, this decline in LOS is projected to occur even without reuse of the site. The amount of traffic added to the local system as a result of the Proposed Action would represent only a small proportion of traffic on the roadway system during peak hours. LOS on Andrews Road between M-150 and 155th Street is projected to decline from B under closure and No-Action Alternative conditions to C as a result of reuse-related increases in traffic; however, this would still be an acceptable LOS. LOS on North Scott Avenue between M-58 and Markey Road is projected to be C under the Proposed Action. This is less than the LOS B projected under No-Action Alternative conditions, although still acceptable; LOS on this segment will improve from closure conditions (LOS E) as a result of planned widening.

Airspace/Air Traffic. The air traffic control tower and instrument approach would remain in service. The Class D/E airspace associated with these air traffic services would remain applicable. Military approach and departure procedures would be discontinued. Military transient operations would follow applicable civilian procedures. Traffic approaching and departing Richards-Gebaur Airport would remain under the jurisdiction of Kansas City Approach/Departure Control. This increase in activity could be accommodated by the existing airspace and air traffic control system. Because no RAPCON or TRACON is based at Richards-Gebaur Airport, airspace management would not be affected.

The recommissioning of the crosswind Runway 6/24 under the Proposed Action would require FAA review in order to reestablish the associated reserved airspace. Traffic from both runways would interact, but use of the ATCT would prevent interference.

Based on the FAA's guidelines, Richards-Gebaur Airport would have a capacity of approximately 210,000 annual aircraft operations. The projected activity levels could be accommodated by the airfield without noticeable aircraft delays. Based upon the Air Force's airspace analysis conducted for this EIS, operations at other regional airports would be affected only minimally, if at all.

Air Transportation. Impacts to air transportation as a result of implementing the Proposed Action at Richards-Gebaur AFB would be minor. General aviation activity is expected to grow at normal rates during the planning

period, with minimal shifting of civilian aircraft from alternative facilities to Richards-Gebaur Airport.

Under the Proposed Action, scheduled passenger service would consist of 15 daily flights, 5 days a week, using turboprop aircraft. Scheduled commuter passenger service at Richards-Gebaur Airport would compete with service at Kansas City Downtown Airport. Because there is not enough demand for both airports to sustain service, a likely impact would be the loss of service at Kansas City Downtown Airport.

Cumulative Impacts. Planned improvements to segments of M-58, M-150, and North Scott Avenue (see Table 4.2-7) would result in beneficial impacts as a result of increased capacity and, thus, improved LOS on these segments.

Mitigation Measures. No adverse impacts to surface or air traffic have been identified; therefore, mitigation measures would not be necessary. The impact of loss of service at the Kansas City Downtown Airport would be mitigated by the provision of commuter service at Richards-Gebaur Airport.

4.2.3.2 Aviation Alternative

Roadways. The number of peak hour trips would be less than those under the Proposed Action. Project-related traffic during the peak hour on M-150 and Andrews Road would be approximately 200 vehicles compared to 250 vehicles for the Proposed Action. The reuse effects on LOS for all roads would be the same (see Table 4.2-7) as those for the Proposed Action.

Airspace/Air Traffic. Based on the Air Force's airspace analysis conducted for this EIS, effects of reuse under the Aviation Alternative would be similar to those under the Proposed Action. Because this alternative also includes commuter service at Richards-Gebaur Airport, it is likely that commuter services at Kansas City Downtown Airport would be terminated.

Air Transportation. Effects of reuse under this alternative would be similar to those described for the Proposed Action.

Cumulative Impacts. Cumulative impacts on LOS along local roadways would be the same as those discussed for the Proposed Action.

Mitigation Measures. No adverse impacts to surface or air traffic have been identified; therefore, mitigation measures would not be necessary. The impact of loss of service at Kansas City Downtown Airport would be mitigated by the provision of commuter service at Richards-Gebaur Airport.

4.2.3.3 Aviation with Mixed Use Alternative

Roadways. The number of peak hour trips would be the same as those under the Proposed Action. Project-related traffic during the peak hour on all of the roadways would be similar and the reuse effects on LOS would be the same (see Table 4.2-7) as the Proposed Action.

Airspace/Air Traffic. Based on the Air Force's airspace analysis conducted for this EIS, effects of reuse would be negligible, similar to the Proposed Action.

Air Transportation. Effects of reuse under this alternative would be similar to those described under the Proposed Action except there would be no loss of commuter services at Kansas City Downtown Airport.

Cumulative Impacts. Cumulative impacts on LOS along local roadways would be the same as discussed for the Proposed Action.

Mitigation Measures. No adverse transportation impacts have been identified; therefore, mitigation measures would not be necessary.

4.2.3.4 Industrial Alternative

Roadways. The number of peak hour trips would be less than those under the Proposed Action. Project-related traffic during the peak hour on M-150 and Andrews Road would be approximately 200 vehicles compared to 250 vehicles for the Proposed Action. The reuse effects on LOS for all roads would be the same (see Table 4.2-7) as those for the Proposed Action.

Airspace/Air Traffic. Based on the Air Force's airspace analysis conducted for this EIS, effects of reuse would be negligible, similar to the Proposed Action.

Air Transportation. Effects of reuse under this alternative would be similar to those described under the Proposed Action except there would be no loss of commuter services at Kansas City Downtown Airport.

Cumulative Impacts. Cumulative impacts on LOS along local roadways would be the same as discussed for the Proposed Action.

Mitigation Measures. No adverse transportation impacts have been identified; therefore, mitigation measures would not be necessary.

4.2.3.5 No-Action Alternative. As discussed in Section 4.2.3.1, LOS on several regional roadways would be degraded as a result of baseline population and employment growth in the region even without reuse of Richards-Gebaur AFB (see Table 4.2-7). The airfield would continue to be

used for general aviation and military transient operations, exhibiting normal growth from closure conditions. There would be no impact on air traffic or air transportation.

4.2.4 Utilities

Direct and indirect changes in future utility use for the Proposed Action and each alternative were estimated based on historic, preclosure, and per-capita average daily use on Richards-Gebaur AFB and in the ROI. These factors were applied to projections of numbers of future residents and employees associated with each of the alternatives. Table 4.2-8 shows the projected changes in utility demand for 5, 10, and 20 years after closure. The figures shown for the No-Action Alternative generally reflect the change expected in utility use in the area without redevelopment of the base. The other alternatives reflect the growth anticipated with base reuse.

4.2.4.1 Proposed Action. Table 4.2-8 presents a summary of ROI utility demands and percentage increases associated with the Proposed Action.

Water Demand. The Proposed Action would increase the total projected potable water use in the ROI to 128.49 MGD in 2014, an increase of 0.37 MGD over projections without reuse. With a capacity to process 230 MGD of potable water, Kansas City would be able to meet the 0.29 percent increase in 2014.

On-base potable water demands would increase from less than 0.001 MGD at closure in 1994 to 0.34 MGD by the year 2014. Reuse of the on-base system may require certain improvements depending on the type and location of industrial development that occurs. Once specific development proposals are identified, improvements can be designed through coordination with the local purveyor.

Wastewater. The Proposed Action would increase the total projected wastewater flow in the ROI by 0.34 MGD or 0.26 percent, to 132.5 MGD by 2014. The ROI has a treatment capacity of 194.5 MGD and the various purveyors would continue to program facility expansions to meet the growing demand.

Wastewater flows on base would increase from less than 0.001 MGD in 1994 to 0.31 MGD by 2014. New industrial users may find it necessary to provide industrial pretreatment systems prior to discharging to the Little Blue Valley Sewer District system.

Solid Waste. Under the Proposed Action, solid waste disposal rates in the ROI would increase to 5,839 tons per day by 2014, compared to 5,832 tons per day without reuse. The lifespan of existing landfills in the ROI would be only slightly affected with this 0.12 percent increase. Planning

Table 4.2-8. Total Projected Utility Consumption in the ROI

	1999			2004			2014		
	Total ROI	Reuse-Related	Percent Increase	Total ROI	Reuse-Related	Percent Increase	Total ROI	Reuse-Related	Percent Increase
Water Consumption (MGD)									
No-Action Alternative	110.36			115.99			128.12		
Proposed Action	110.45	0.093	0.08	116.18	0.186	0.16	128.49	0.371	0.29
Aviation Alternative	110.42	0.064	0.06	116.08	0.089	0.08	128.21	0.092	0.07
Aviation with Mixed Use Alternative	110.40	0.043	0.04	116.05	0.057	0.05	128.19	0.073	0.06
Industrial Alternative	110.39	0.031	0.03	116.06	0.066	0.06	128.20	0.083	0.06
Wastewater Treatment (MGD)									
No-Action Alternative	129.02			130.19			132.16		
Proposed Action	129.11	0.085	0.07	130.36	0.169	0.13	132.50	0.338	0.26
Aviation Alternative	129.09	0.072	0.06	130.29	0.102	0.08	132.27	0.106	0.08
Aviation with Mixed Use Alternative	129.07	0.047	0.04	130.25	0.063	0.05	132.24	0.080	0.06
Industrial Alternative	129.05	0.035	0.03	130.27	0.076	0.06	132.25	0.094	0.07
Solid Waste Disposal (tons/day)									
No-Action Alternative	4,955			5,208			5,832		
Proposed Action	4,956.75	1.75	0.04	5,211.51	3.51	0.07	5,839	7.00	0.12
Aviation Alternative	4,956.64	1.64	0.03	5,210.02	2.02	0.04	5,834.02	2.02	0.03
Aviation with Mixed Use Alternative	4,956.28	1.28	0.03	5,209.47	1.47	0.03	5,833.70	1.70	0.03
Industrial Alternative	4,955.64	0.64	0.01	5,209.20	1.20	0.02	5,833.44	1.44	0.02
Electrical Consumption (MWH/day)									
No-Action Alternative	35,038			38,637			47,105		
Proposed Action	35,057	19.00	0.05	38,675.01	38.01	0.10	47,180.95	75.95	0.16
Aviation Alternative	35,054.57	16.57	0.05	38,660.91	23.91	0.06	47,130.53	25.53	0.05
Aviation with Mixed Use Alternative	35,054.05	16.05	0.05	38,659.04	22.04	0.06	47,134.30	29.30	0.06
Industrial Alternative	35,051.92	13.92	0.04	38,659.63	22.63	0.06	47,134.29	29.29	0.06
Natural Gas Consumption (MMCF/day)									
No-Action Alternative	641.00			674.00			745.00		
Proposed Action	641.24	0.24	0.04	674.47	0.47	0.07	745.94	0.94	0.13
Aviation Alternative	641.23	0.23	0.04	674.34	0.34	0.05	745.35	0.35	0.05
Aviation with Mixed Use Alternative	641.20	0.20	0.03	674.27	0.27	0.04	745.35	0.35	0.05
Industrial Alternative	641.18	0.18	0.03	674.31	0.31	0.05	745.38	0.38	0.05

MGD = million gallons per day.
MMCF/day = million cubic feet per day.
MWH/day = megawatt-hours per day.
ROI = Region of Influence

efforts are under way to identify expansions or new landfill locations to serve the ROI.

Solid waste generated on base, included in the amount above, would increase by 6.44 tons per day from 0.12 ton per day in 1994 to 6.56 tons per day in 2014.

Energy

Electricity. Project-related demands of 75.95 MWH/day would increase electrical consumption in the ROI to 47,180 MWH/day. The increase of 0.16 percent should be adequately met by KCP&L and MPS generation facilities.

By 2014, the Proposed Action would increase consumption on base by 74 MWH/day, from 13.4 MWH/day at closure (1994) to 87.40 MWH/day in 2014. The substation and distribution system could support the proposed reuse of Richards-Gebaur AFB, although a new distribution system may need to be established for the new industrial space. Once specific proposals are identified, improvements can be negotiated with MPS. Individual facilities would need to be metered to monitor costs and to charge individual users; appropriate utility corridors and easements would also need to be established.

Natural Gas. The Proposed Action would generate a demand of 0.94 MMCF/day in the ROI by the year 2014. Natural gas demands in the ROI are forecast to equal 746 MMCF/day by 2014 without base reuse. The increase of 0.13 percent would be adequately met by Missouri Gas Energy supplies.

Natural gas use on base would increase by 0.92 MMCF/day, from 0.06 MMCF/day in 1994 to 0.98 MMCF/day in 2014. The existing on-base natural gas distribution system would require some changes to accommodate the reuse of the base, including installation of individual gas meters at most facilities. Establishment of appropriate utility corridors and easements would be required.

Mitigation Measures. Mitigation measures would need to address industrial pretreatment of wastewater generated by future industrial and commercial reuses of the site. The type(s) and extent of mitigation measures cannot be specified at this time, because they would be dependent on the chemical and physical characteristics of the wastewater. New users would also be required to obtain discharge permits from Kansas City.

4.2.4.2 Aviation Alternative. Table 4.2-8 presents a summary of ROI utility demands and percentage increases associated with this alternative.

Water Demand. The Aviation Alternative would increase the total projected potable water use in the ROI to 128.21 MGD in 2014, an increase of 0.092 MGD over projections without reuse. With a capacity to process 230 MGD of potable water, Kansas City would be able to meet the 0.07 percent increase in 2014.

On-base potable water use would increase from less than 0.001 MGD at closure in 1994 to 0.043 MGD by 2014. Reuse of the on-base system may require certain improvements depending on the type and location of industrial development that occurs. Approximately half (0.024 MGD) of the on-base water use would be at the residential area proposed for the Belton Training Complex; a connection with the Cass County Water Supply District No. 2 system would be required to provide that area with water. Once specific development proposals are identified, improvements can be designed through coordination with the local purveyor.

Wastewater. This alternative would increase the total projected wastewater flow in the ROI by 0.106 MGD, or 0.08 percent, to 132.27 MGD by 2014. The ROI has a treatment capacity of 194.5 MGD and the various purveyors would continue to program facility expansions to be able to meet the growing demand.

Wastewater flows on base would increase from less than 0.001 MGD in 1994 to 0.054 MGD by 2014. New industrial users may find it necessary to provide industrial pretreatment systems prior to discharging to the Little Blue Valley Sewer District system. Also, the construction of a new sewer or the use of individual septic systems at the Belton Training Complex would be necessary to provide service to the proposed residential development. There are no sewers in that portion of Cass County.

Solid Waste. Under the Aviation Alternative, solid waste disposal rates in the ROI would increase to 5,834 tons per day by 2014, compared to 5,832 tons per day without reuse. The lifespan of existing landfills in the ROI would be only slightly affected with this 0.03 percent increase. Planning efforts are under way to identify expansions or new landfill locations to serve the ROI.

Solid waste generated on base, included in the amount above, would increase by 1.68 tons per day, from 0.12 ton per day in 1994 to 1.8 tons per day in 2014.

Energy

Electricity. Reuse-related demands of 25.53 MWH/day would increase electrical consumption in the ROI to 47,130 MWH/day. The increase of 0.05 percent should be adequately met by KCP&L and MPS generation facilities.

By 2014, this alternative would increase consumption on base by 24.09 MWH/day, from 13.4 MWH/day at closure (1994) to 37.49 MWH/day in 2014. The substation and distribution system could support the proposed reuse of Richards-Gebaur AFB, although a new distribution system may need to be established for the new industrial space. Once specific proposals are identified, improvements can be negotiated with MPS. Individual facilities would need to be metered to monitor costs and to charge individual users; appropriate utility corridors and easements would also need to be established.

Natural Gas. The Aviation Alternative would generate a demand of 0.35 MMCF/day in the ROI by 2014. Natural gas demands in the ROI are forecast to equal 745 MMCF/day by 2014 without base reuse. The increase of 0.05 percent would be adequately met by Missouri Gas Energy supplies.

Natural gas use on base would increase by 0.337 MMCF/day, from 0.06 MMCF/day in 1994 to 0.397 MMCF/day in 2014. The existing on-base natural gas distribution system would require some changes to accommodate the reuse of the base, including installation of individual gas meters at most facilities. Appropriate utility corridors and easements would also have to be established. New natural gas service would have to be provided for the proposed housing at the Belton Training Complex.

Mitigation Measures. Mitigation measures would be similar to those discussed for the Proposed Action. In addition, water, wastewater, and natural gas services would have to be provided to support residential reuse of the Belton Training Complex.

4.2.4.3 Aviation with Mixed Use Alternative. Table 4.2-8 presents a summary of projected ROI utility use and percentage increases associated with this alternative.

Water Demand. The Aviation with Mixed Use Alternative would increase the total projected potable water demand in the ROI to 128.19 MGD in 2014, an increase of 0.073 MGD over projections without reuse. With its capacity to process 230 MGD of potable water, Kansas City would be able to meet the 0.06 percent increase in usage in 2014.

On-base potable water use would increase from less than 0.001 MGD at closure in 1994 to 0.043 MGD by 2014. Reuse of the on-base system may require certain improvements depending on the type and location of industrial development that occurs. The recreational facilities proposed at the Belton Training Complex parcel would use 100 gallons per day, which would probably be supplied via a connection with the Cass County Water Supply District No. 2 system. Once specific development proposals are identified, improvements can be designed through coordination with the local purveyor.

Wastewater. This alternative would increase the total projected wastewater flow in the ROI by 0.08 MGD, or 0.06 percent, to 132.24 MGD by 2014. The ROI has a treatment capacity of 194.5 MGD and the various purveyors would continue to program facility expansions to be able to meet the growing demand.

Wastewater flows on base would increase from less than 0.001 MGD in 1994 to 0.054 MGD by 2014. New industrial users may find it necessary to provide industrial pretreatment systems prior to discharging to the Little Blue Valley Sewer District system. Construction of a septic system at the Belton Training Complex would be necessary to provide service to the proposed recreational facilities, because there are no sewers in that portion of Cass County.

Solid Waste. Under the Aviation with Mixed Use Alternative, solid waste disposal rates in the ROI would increase to 5,834 tons per day by 2014 compared to 5,832 tons per day without reuse. The lifespan of existing landfills in the ROI would be slightly affected with this 0.03 percent increase. Planning efforts are under way to identify expansions or new landfill locations to serve the ROI.

Solid waste generated on base, included in the amount above, would increase by 1.2 tons per day, from 0.12 ton per day in 1994 to 1.32 tons per day in 2014.

Energy

Electricity. Reuse-related demands of 29.3 MWH/day would increase electrical consumption in the ROI to 47,134 MWH/day. The increase of 0.06 percent should be adequately met by KCP&L and MPS generation facilities.

By 2014 this alternative will increase consumption on base by 27.58 MWH/day, from 13.4 MWH/day at closure (1994) to 40.98 MWH/day in 2014. The substation and distribution system could support the proposed reuse of Richards-Gebaur AFB, although a new distribution system may need to be established for the new industrial space. Once specific proposals are identified, improvements can be negotiated with MPS. Individual facilities would need to be metered to monitor costs and to charge individual users; appropriate utility corridors and easements would also need to be established.

Natural Gas. The Aviation with Mixed Use Alternative would generate a demand of 0.35 MMCF/day in the ROI by 2014. Natural gas demands in the ROI are forecast to equal 745 MMCF/day by 2014 without base reuse. The increase of 0.05 percent would be adequately met by Missouri Gas Energy supplies.

Natural gas use on base would increase by 0.327 MMCF/day, from 0.06 MMCF/day in 1994 to 0.387 MMCF/day in 2014. The existing on-base natural gas distribution system would require some changes to accommodate the reuse of the base, including installation of individual gas meters at most facilities. Appropriate utility corridors and easements would also have to be established.

Mitigation Measures. Potential mitigation measures for reducing impacts due to the Aviation with Mixed Use Alternative would be similar to those identified for the Proposed Action. In addition, water and wastewater services would have to be provided to support the regional park proposed for the Belton Training Complex.

4.2.4.4 Industrial Alternative. Table 4.2-8 presents a summary of projected ROI utility use and percentage increases associated with this alternative.

Water Demand. The Industrial Alternative would increase the total projected potable water demand in the ROI to 128.20 MGD in 2014, an increase of 0.083 MGD over projections without reuse. With its capacity to process 230 MGD of potable water, Kansas City would be able to meet the 0.06 percent increase in usage in 2014.

On-base potable water use would increase from less than 0.001 MGD at closure in 1994 to 0.058 MGD by 2014. Reuse of the on-base system may require certain improvements depending on the type and location of industrial development that occurs. Once specific development proposals are identified, improvements can be designed through coordination with the local purveyor.

Wastewater. This alternative would increase the total projected wastewater flow in the ROI by 0.09 MGD, or 0.07 percent, to 132.25 MGD by 2014. The ROI has a treatment capacity of 194.5 MGD and the various purveyors would continue to program facility expansions to be able to meet the growing demand.

Wastewater flows on base would increase from less than 0.001 MGD in 1994 to 0.073 MGD by 2014. New industrial users may find it necessary to provide industrial pretreatment systems prior to discharging to the Little Blue Valley Sewer District system.

Solid Waste. Under the Industrial Alternative, solid waste disposal rates in the ROI would increase to 5,833 tons per day by 2014, compared to 5,832 tons per day without reuse. The lifespan of existing landfills in the ROI would be slightly affected with this 0.02 percent increase. Planning efforts are under way to identify expansions or new landfill locations to serve the ROI.

Solid waste generated on base, included in the amount above, would increase by 1.04 tons per day from 0.12 ton per day in 1994 to 1.16 tons per day in 2014.

Energy

Electricity. Reuse-related demands of 29.29 MWH/day would increase electrical consumption in the ROI to 47,134 MWH/day. The increase of 0.06 percent should be adequately met by KCP&L and MPS generation facilities.

By 2014, this alternative would increase consumption on base by 27.90 MWH/day, from 13.4 MWH/day at closure (1994) to 41.3 MWH/day in 2014. The substation and distribution system could support the proposed reuse of Richards-Gebaur AFB, although a new distribution system may need to be established for the new industrial space. Once specific proposals are identified, improvements can be negotiated with MPS. Individual facilities would need to be metered to monitor costs and to charge individual users; appropriate utility corridors and easements would also need to be established.

Natural Gas. The Industrial Alternative would generate a demand of 0.38 MMCF/day in the ROI by 2014. Natural gas demands in the ROI are forecast to equal 745 MMCF/day by 2014 without base reuse. The increase of 0.05 percent would be adequately met by Missouri Gas Energy supplies.

Natural gas use on base would increase by 0.366 MMCF/day from 0.06 MMCF/day in 1994 to 0.426 MMCF/day in 2014. The existing on-base natural gas distribution system would require some changes to accommodate the reuse of the base, including installation of individual gas meters at most facilities. Establishment of appropriate utility corridors and easements would also be required.

Mitigation Measures. Potential mitigation measures for reducing impacts due to the Industrial Alternative would be similar to those identified for the Proposed Action. In addition, water would have to be provided to support agricultural reuse of the Belton Training Complex.

4.2.4.5 No-Action Alternative. Utility use on base would be minimal in comparison to the reuse alternatives. The disuse of portions of the utility systems, however, could result in their degradation over the long term. On-base utility projections at closure are shown below. Table 4.2-8 shows the No-Action Alternative utility use forecast using per capita factors developed from data provided by the utility providers in the study area.

Water - less than 0.001 MGD
Wastewater - less than 0.001 MGD

Solid Waste - 0.12 ton per day
Electricity - 13.4 MWH/day
Natural Gas - 0.06 MMCF/day.

4.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT

This section addresses the potential impacts of existing contaminated sites on the various reuse options, and the potential for environmental impacts caused by hazardous materials/waste practices associated with the reuse options. Hazardous materials/wastes, IRP sites, storage tanks, asbestos, pesticides, PCBs, radon, medical/biohazardous wastes, ordnance, and lead-based paint will be discussed within this section.

The U.S. Air Force is committed to the remediation of all contamination at Richards-Gebaur AFB due to past Air Force activities. The OL will remain after base closure to coordinate remediation activities. Delays or restrictions in disposal and reuse of property may occur due to the extent of contamination and the results of both the risk assessment and remedial designs determined for contaminated sites. Examples of conditions resulting in land use restrictions would be the location of long-term monitoring wells or remedial equipment. These conditions would have to be considered in the layout of future development. Options to recipients include creation of parks, greenbelts, open spaces, or construction plans accommodating these areas.

Regulatory standards and guidelines have been applied in determining the impacts caused by hazardous materials/waste. The following criteria were used to identify potential impacts:

- Exposure of the environment or public to any hazardous material through release or disposal practices
- Manufacturing of any compound that requires notifying the pertinent regulatory agency
- Any spill or release of a reportable quantity of a hazardous material
- Generation of 100 kilograms (or more) of hazardous waste in a calendar month, resulting in increased regulatory requirements
- Operational requirements or service for all UST and tank systems
- Accidental release of friable asbestos during the demolition or modification of a structure.

4.3.1 Proposed Action

4.3.1.1 Hazardous Materials Management. The hazardous materials likely to be utilized for the activities occupying the proposed land use zones are identified in Table 4.3-1. Hazardous materials typical of aircraft support and maintenance operations, similar to those used by the base under preclosure conditions, would continue to be used. New industries could introduce the use of hazardous materials different from those in use prior to closing. Military reuse of industrial shops and vehicle and equipment maintenance shops would continue to use hazardous materials similar to those used prior to closure. The quantity of hazardous materials utilized under the Proposed Action would increase over closure conditions due the increased use of aviation support buildings, the start up of new industrial operations or industrial parks, and the continued use of vehicle and equipment maintenance shops by other military organizations. The specific chemical compositions and exact use rates associated with the proposed reuse activities are not known.

If the Proposed Action were implemented, each separate organization would be responsible for the management of hazardous materials according to applicable regulations. Additionally, each organization would have to comply with EPCRA, Section 311, Title III and 10 CSR 24-4, which require that local communities be informed of the local industries' use of hazardous materials.

4.3.1.2 Hazardous Waste Management. Hazardous wastes would be generated under the Proposed Action from the hazardous materials and processes that utilize those materials. These wastes include solvents, paints, thinners, oils, POL, fuels, corrosives, heavy metals, and batteries. The responsibilities for managing hazardous wastes would fall under the individual organizations generating the wastes. These responsibilities include worker training requirements under OSHA regulations (29 CFR 1901-1926), emergency planning under 10 CSR 24-4, as well as hazardous waste generation regulations under 10 CSR 25.

Generation of hazardous waste would increase over the closure baseline levels due to greater utilization of aviation support facilities, new industries/ industrial parks, and military reuse of various shops. The presence of numerous independent owners/operators on the base would increase the number of hazardous waste generators subject to regulatory requirements and correspondingly increase the regulatory burden relative to hazardous waste management. However, hazardous waste management by all independent owner/operators in accordance with applicable regulations would preclude any unacceptable impacts.

Table 4.3-1. Hazardous Material Usage by Land Use

Land Use	Operation Process	Hazardous Materials
Aviation Support [a,b,c,d]	Operations associated with aircraft maintenance and manufacturing, air transportation-related industry and warehousing, fire station, other administrative services	Fuels, solvents, POL, hydraulic fluids, degreasers, corrosives, heavy metals, reactives, paints, thinners, glycols, ignitibles, heating oils, cyanide
Industrial [a,b,c,d]	Activities associated with light industry, manufacturing, research and development, warehousing	Fuels, solvents, POL, corrosives, heavy metals, ignitibles, heating oils, catalysts, pesticides
Institutional (Medical) [d]	Hospital/clinic, dental clinic, X-ray unit	Pharmaceuticals, chemotherapeutic drugs, radiological sources, heavy metals
Institutional (Educational) [c,d]	Public education, higher education, research labs, training facilities, vocational and technical training schools	Solvents, POL, corrosives, paints, thinners, ignitibles, heating oils, cleaners, pesticides
Commercial [a,c,d]	Activities associated with offices, warehousing, retail, service industries, restaurants	Fuels, solvents, POL, corrosives, ignitibles, heating oils, pesticides
Residential [b,d]	Utilization/maintenance of single-family and multi-family units, landscaping	Fuels, oils, pesticides, fertilizers, chlorine, household chemicals
Public Facilities/Recreation [b,c,d]	Maintenance of existing recreational facilities including indoor and outdoor sports complex, swimming pools, other recreational facilities	Solvents, POL, heating oils, aerosols, paints, thinners, cleaners, pesticides, fertilizers, chlorine
Agriculture [d]	Equipment maintenance, weed and pest control	Fuels, solvents, paints, thinners, pesticides, fertilizers
Military [a]	Activities associated with offices, housing, recreation, medical, training exercises, vehicle and equipment maintenance	Fuels, solvents, corrosives, heavy metals, paint, thinners, pesticides, pharmaceuticals, radiological sources, chlorine, lead-acid batteries

Notes: (a) Land use included in Proposed Action.
(b) Land use included in Aviation Alternative.
(c) Land use included in Aviation with Mixed Use Alternative.
(d) Land use included in Industrial Alternative.
POL = petroleum, oil, and lubricants.

4.3.1.3 Installation Restoration Program Sites. The U.S. Air Force is committed to continue IRP activities under DERP and CERCLA in accordance with the DSMOA. IRP activities will be coordinated by the OL.

The type of development that is appropriate for property adjacent to or over an IRP site may be limited by the risk to human health and the environment posed by contaminants at the site. The risk posed by IRP sites is measured by a risk assessment that analyzes the types of substances present at a site and the potential means by which the public and the environment may be exposed to them. Baseline risk assessments are part of the IRP and can be found in the Administrative Record. The RD, or blueprint for remediating the IRP site, considers the results of the risk assessment and the vertical and lateral extent of the contamination.

Disposal and reuse of some Richards-Gebaur AFB properties may be delayed or limited by the extent and type of contamination at IRP sites and by current and future IRP remediation activities (Figure 4.3-1). Based on the results of IRP investigations, the Air Force may, where appropriate, place limits on land reuse through deed restrictions on conveyances and use restrictions on leases. The Air Force may also retain right of access to other properties for monitoring well sampling or remedial construction and maintenance.

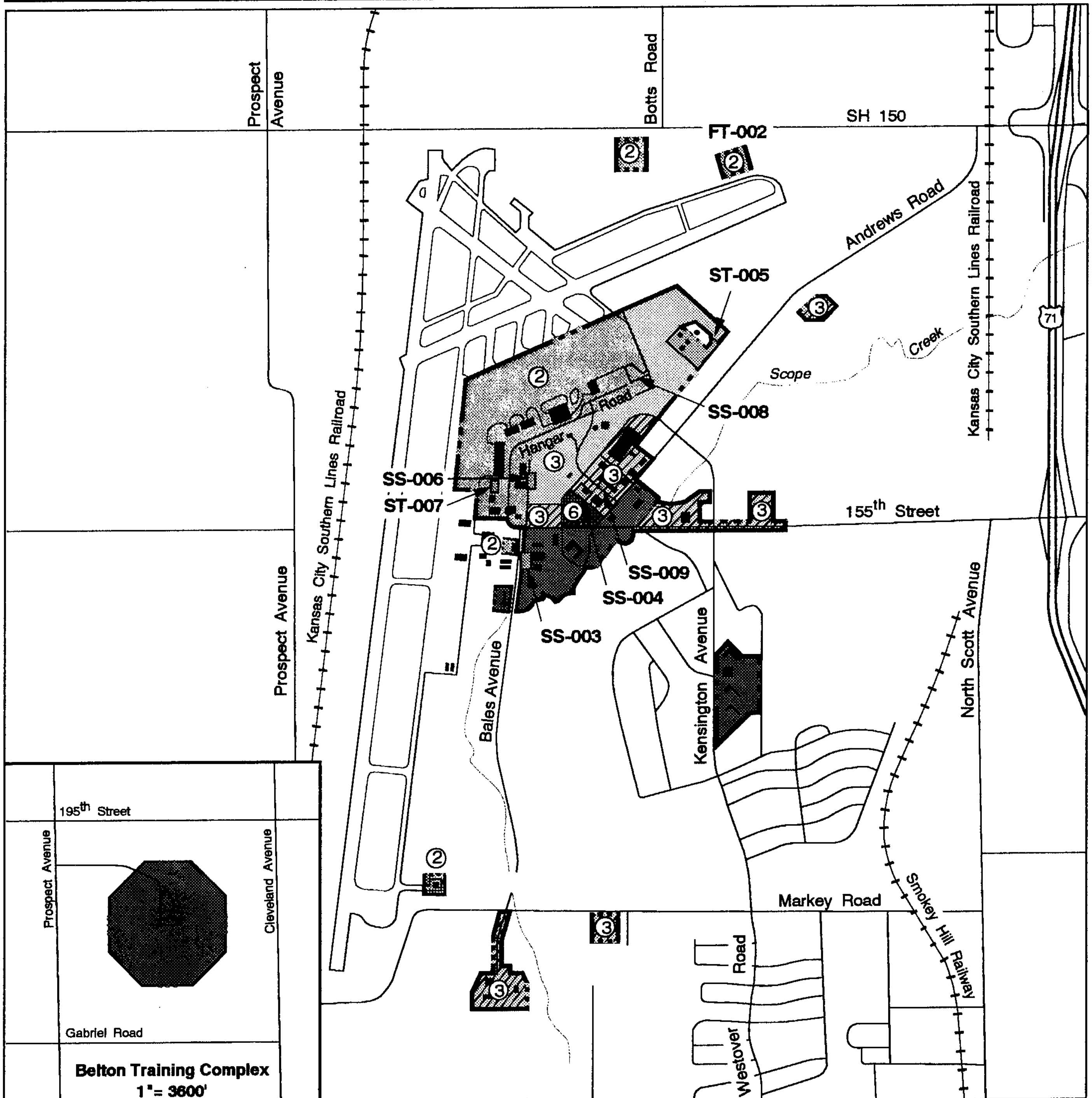
Determination of future base land uses will be, to a certain extent, dependent upon a regulatory review of the remedial designs and monitoring requirements of the IRP sites. This regulations review identifies current monitoring well locations and future land use limitations as a result of their presence. The review process would include notifying the FAA concerning the construction and locations of any monitoring wells.

The IRP sites within each land use area for the Proposed Action are summarized in Table 4.3-2 and discussed below.

Aviation Support. Possible soil or groundwater remediation at FT-002 and SS-008 may delay property disposal and redevelopment; long-term monitoring could result in land use restrictions. Regulatory acceptance of the NFAP DD for ST-007 would preclude impacts on reuse.

Industrial. The planned soil remediation at ST-005 may delay property disposal and redevelopment; long-term monitoring could result in land use restrictions. Successful completion of the interim remedial action at SS-006 would preclude impacts on reuse.

Industrial (OIP). Regulatory concurrence of the NFAP DD at SS-004 would preclude impacts to reuse. Possible soil or groundwater remediation at SS-009 may delay property disposal and redevelopment; long-term monitoring could result in land use restrictions.



EXPLANATION

① Airfield *	④ Institutional (Medical) *
② Aviation Support	⑤ Institutional (Educational) *
③ Industrial	⑥ Commercial
③ Office/Industrial Park (OIP)	⑦ Residential *
⑧ Public Facilities/ Recreation *	⑨ Agriculture *
Military	IRP Site
Base Boundary	

0 500 1000 2000 Feet

*Standard land use designation not applicable to this figure.

IRP Sites - Proposed Action

Figure 4.3-1

Table 4.3-2. IRP Sites within Land Use Areas

Proposed Land Use	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative
Aviation Support	FT-002, ST-007, SS-008	FT-002, ST-005, SS-006, ST-007, SS-008	ST-007, SS-008	ST-007
Industrial	ST-005, SS-006	SS-004, SS-009	FT-002, SS-003, SS-004, ST-005, SS-006, SS-009	SS-004, ST-005, SS-006, SS-009
Office/Industrial Park	SS-004, SS-009	NA	NA	NA
Institutional (Medical)	NA	NA	NA	None
Institutional (Educational)	NA	NA	None	SS-003, SS-008
Commercial	None	NA	None	FT-002
Residential	NA	None	NA	None
Public Facilities/ Recreation	NA	SS-003	None	None
Military	SS-003	NA	NA	NA
Agriculture	NA	NA	NA	None

NA = Standard land use designation not applicable to this alternative.

Commercial. There are no identified IRP sites in this land use.

Military. Regulatory concurrence with the NFAP DD at SS-003 would preclude impacts to reuse.

4.3.1.4 Storage Tanks. The base plans to remove all regulated USTs, in accordance with MDNR regulations, prior to disposal. No USTs are planned for reuse. Any new USTs would be subject to applicable regulations that specify leak detection, spill and overfill protection, cathodic protection, secondary containment for the tank systems including the piping, and liability insurance. The base also plans to remove all active oil/water separators before base closure. Aviation support, military and industrial activities may require the use of ASTs. New and reused ASTs would be subject to applicable federal, state and local regulations. ASTs that would not be utilized to support the reuse activities will be closed according to state Fire Marshal's standards.

4.3.1.5 Asbestos. Renovation and demolition of existing structures with ACM may occur with reuse and development. Such activities would be subject to all applicable federal, state and local regulations to minimize potential risks to human health and the environment.

4.3.1.6 Pesticide Usage. The level of use and applications of pesticides would increase from base closure levels. Pesticides would continue to be used to maintain the various land use zones and associated structures. Management practices would be subject to FIFRA and the Missouri Department of Agriculture regulations under State Statute 281; therefore, no unacceptable impacts would result.

4.3.1.7 Polychlorinated Biphenyls. There is no federally or state regulated PCB equipment or PCB contaminated equipment on Richards-Gebaur AFB. Therefore, PCBs would not create any impacts to reuse and development.

4.3.1.8 Radon. It is possible that radon may be present in levels exceeding 4 pCi/l on base. New owners of the dormitories in the Billeting Complex should perform radon testing prior to the use of the structures, to indicate if mitigation measures are necessary.

4.3.1.9 Medical/Biohazardous Waste. The use of the medical clinic on base by the U.S. Marine Corps should result in quantities and types of waste generated similar to those prior to closure. The management of infectious wastes according to 10 CSR 80-7 would preclude any unacceptable impacts.

4.3.1.10 Ordnance. Ordnance will be removed from the Weapons Bunker prior to base closure. Richards-Gebaur AFB has never operated an explosive ordnance disposal range. Ordnance should not impact reuse activities.

An investigation of soils at the Small Arms Range determined that lead concentrations were below regulatory action levels and no remediation is necessary. Therefore, there will be no lead impacts on reuse associated with the range.

4.3.1.11 Lead-Based Paint. Base reuse and development proposals may involve the demolition or renovation of existing structures that may contain lead-based paints. Lead-based paint would be removed and disposed in these facilities in accordance with applicable federal, state, and local regulations to minimize potential risks to human health and the environment. The potential presence of lead-based paint in facilities constructed prior to 1978 would be disclosed to the new owners.

4.3.1.12 Mitigation Measures. A cooperative planning body for hazardous materials and waste management could be established with the support of the new individual operators on the base. Establishment of such a body could reduce the costs of environmental compliance training, health and safety training, and waste management, and could increase recycling, minimize waste, and assist in mutual spill response.

All of the IRP sites may not need to be remediated; however all of them must be addressed and properly closed out through the IRP process. Active coordination between the OL and new construction planning agencies could mitigate potential problems. The presence of IRP sites may limit certain land uses within overlying areas; options could include reuse as open space, greenbelt, or parks.

Coordination with the OL for asbestos removal or management in conjunction with construction or renovation activities could mitigate potential impacts. Compliance with NESHAP would mitigate and preclude asbestos exposures.

4.3.2 Aviation Alternative

4.3.2.1 Hazardous Materials Management. The hazardous materials likely to be utilized for the activities occupying the proposed land use zones are identified in Table 4.3-1. Hazardous materials typical of aircraft maintenance and servicing operations, similar to those used by the base under preclosure conditions, would continue to be used. New industries could introduce the use of hazardous materials different from those in use prior to closure. The quantity of hazardous materials utilized under the Aviation Alternative would increase over closure conditions due to the increased use of aviation support buildings as well as the start up of new industrial operations. The specific chemical compositions and exact use rates associated with the proposed reuse activities are not known.

If the Aviation Alternative were implemented, each separate organization would be responsible for the management of hazardous materials according to applicable regulations. Additionally, each organization would have to comply with EPCRA, Section 311, Title III and 10 CSR 24-4, which require that local communities be informed of local industries' use of hazardous materials.

4.3.2.2 Hazardous Waste Management. Hazardous wastes would be generated under the Aviation Alternative from the hazardous materials and the processes that utilize those materials. These wastes include solvents, paints, thinners, heavy metals, oils, and batteries. The responsibilities for managing hazardous wastes would fall under the control of the individual organizations generating the wastes. These responsibilities include worker training requirements under OSHA regulations (29 CFR 1901-1926), emergency planning under 10 CSR 24-4, as well as hazardous waste generation regulations under 10 CSR 25.

The presence of numerous independent owners/operators on the base would increase the number of hazardous waste generators subject to regulatory requirements and correspondingly increase the regulatory burden relative to hazardous waste management. However, hazardous waste management by

all independent owner/operators in accordance with applicable regulations would preclude any unacceptable impacts.

4.3.2.3 Installation Restoration Program Sites. Disposal and reuse of some Richards-Gebaur AFB properties may be delayed or limited by the extent and type of contamination at IRP sites and by current and future IRP remediation activities (Figure 4.3-2). Based on the results of IRP investigations, the Air Force may, where appropriate, place limits on land reuse through deed restrictions on conveyances and use restrictions on leases. The Air Force may also retain right of access to other properties for monitoring well sampling or remedial construction and maintenance.

Determination of future base land uses will be, to a certain extent, dependent upon a regulatory review of the remedial designs and monitoring requirements of the IRP sites. This review will identify current monitoring well locations and future land use limitations as a result of their presence. The regulatory review process would include notifying the FAA concerning the construction and locations of any monitoring wells.

The IRP sites within each land use area for the Aviation Alternative are summarized in Table 4.3-2 and discussed below.

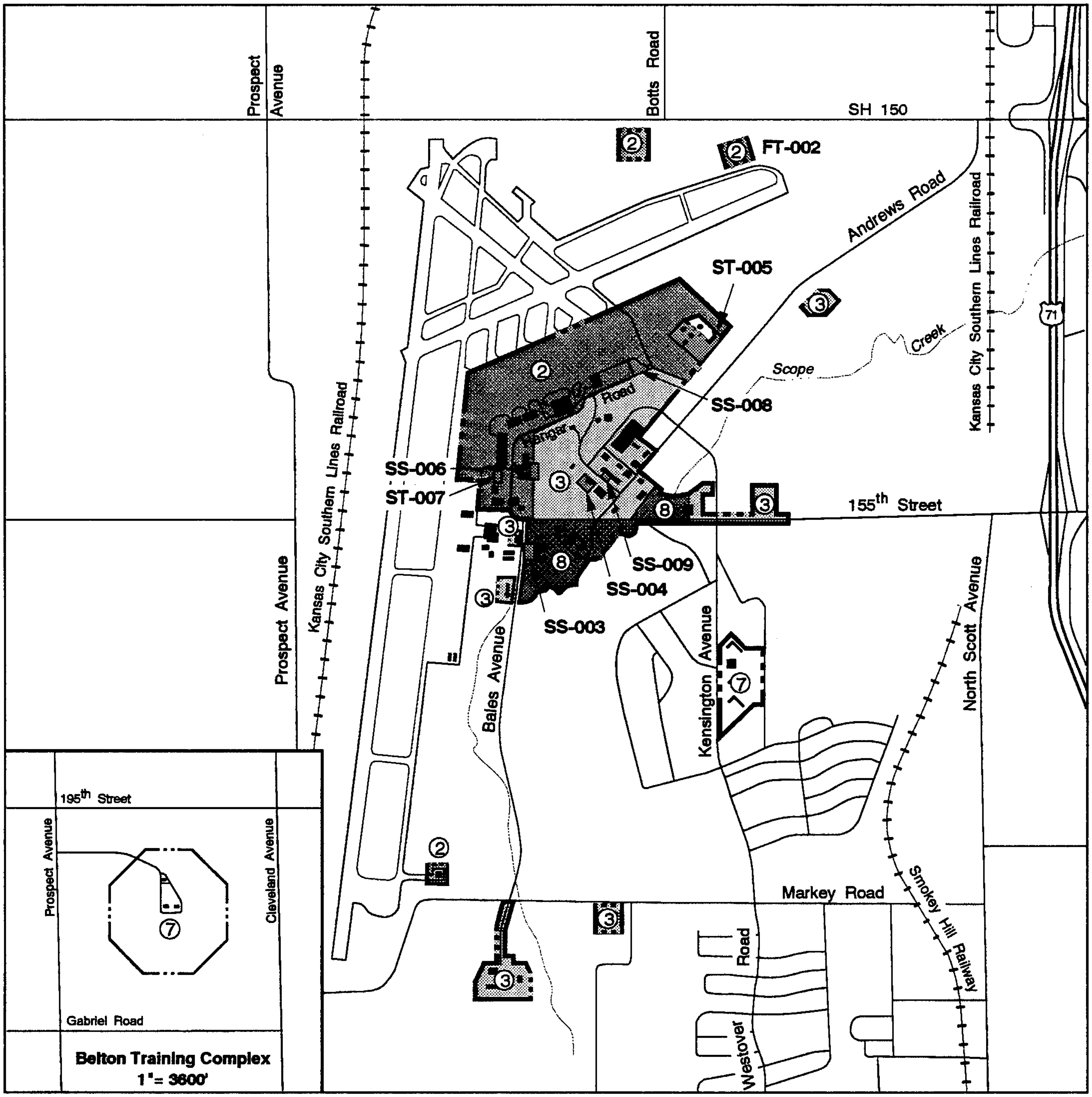
Aviation Support. Possible soil or groundwater remediation at FT-002 and SS-008, as well as the planned soil remediation at ST-005, may delay property disposal and redevelopment; long-term monitoring could result in land use restrictions. Successful completion of the interim remedial action at SS-006 and regulatory acceptance of the NFAP DD for ST-007 would preclude impacts on reuse.

Industrial. Regulatory concurrence with the NFAP DD at SS-004 would preclude impacts to reuse. Possible soil or groundwater remediation at SS-009 may delay property disposal and redevelopment; long-term monitoring could result in land use restrictions.

Residential. There are no identified IRP sites in the residential land use.

Public Facilities/Recreation. Regulatory concurrence with the NFAP DD at SS-003 would preclude impacts to reuse.

4.3.2.4 Storage Tanks. The base plans to remove all regulated USTs, in accordance with MDNR regulations, prior to disposal. No USTs are planned for reuse. Any new USTs would be subject to applicable regulations that specify leak detection, spill and overfill protection, cathodic protection, secondary containment for the tank systems including the piping, and liability insurance. The base also plans to remove all active oil/water separators before base closure. Aviation support operations and new industry would require the use of ASTs. Reused and new ASTs would be



EXPLANATION

① Airfield *	⑤ Institutional (Educational)*	⑨ Agriculture *
② Aviation Support	⑥ Commercial *	IRP Site
③ Industrial	⑦ Residential	Base Boundary
④ Institutional (Medical) *	⑧ Public Facilities/ Recreation	

0 500 1000 2000 Feet

* Standard land use designation not applicable to this figure.

IRP Sites - Aviation Alternative

Figure 4.3-2

subject to applicable federal, state, and local regulations. ASTs that would not be utilized to support the reuse activities would be closed in accordance with state Fire Marshal's standards.

4.3.2.5 Asbestos. Renovation and demolition of existing structures with ACM may occur with reuse and development. Such activities would be subject to all applicable federal, state, and local regulations to minimize potential risks to human health and the environment.

4.3.2.6 Pesticide Usage. The level of use and applications of pesticides would increase from closure levels. Pesticides would continue to be used to maintain the various land use zones and associated structures. Management practices would be subject to FIFRA and the Missouri Department of Agriculture regulations under State Statute 281; therefore, no unacceptable impacts would result.

4.3.2.7 Polychlorinated Biphenyls. There is no federally or state-regulated PCB equipment or PCB-contaminated equipment on Richards-Gebaur AFB. Therefore, PCBs would not create any impacts to reuse and development.

4.3.2.8 Radon. It is possible that radon may be present in levels exceeding 4 pCi/l on base, and should be considered in the construction design of any new residential structures to limit the potential for exposure. Further, new owners of the dormitories in the Billeting Complex should perform radon testing prior to use of the structures, to indicate if mitigation measures are necessary.

4.3.2.9 Medical/Biohazardous Waste. All remaining medical/biohazardous wastes will be removed prior to base closure. Under the Aviation Alternative there would be no medical reuse; therefore, no medical/ biohazardous waste would be generated.

4.3.2.10 Ordnance. Ordnance will be removed from the Weapons Bunker prior to base closure. Richards-Gebaur AFB has never operated an explosive ordnance disposal range. Ordnance should not impact reuse activities.

An investigation of soils at the Small Arms Range determined that lead concentrations were below regulatory action levels and no remediation is necessary. Therefore, there would be no lead impacts on reuse associated with the range.

4.3.2.11 Lead-Based Paint. Base reuse and development proposals may involve the demolition or renovation of existing structures that may contain lead-based paints. Lead-based paint would be removed and disposed in these facilities in accordance with applicable federal, state, and local regulations to minimize potential risks to human health and the environment. Residential reuse of the dormitories could result in exposure to lead-based

paint. The potential presence of lead-based paint in facilities constructed prior to 1978 would be disclosed to the new owners.

4.3.2.12 Mitigation Measures. Mitigation measures for this alternative would be similar to those identified in the Proposed Action. In addition, the scheduling of collection days for hazardous household products such as paints, pesticides, and cleaners could mitigate publicly owned treatment works and storm water discharge concerns. Articles in the local papers and classes offered by community educational programs could increase public awareness on recycling, appropriate use of pesticides, waste minimization, and waste disposal.

4.3.3 Aviation with Mixed Use Alternative

4.3.3.1 Hazardous Materials Management. The hazardous materials likely to be utilized for the activities occupying the proposed land use zones would be similar to those that would be used under the Proposed Action (see Table 4.3-1). The quantity of hazardous materials utilized under the Aviation with Mixed Use Alternative would increase over closure conditions due to the increase of industrial operations as well as the continued use of aviation support facilities. The specific chemical compositions and exact use rates associated with the proposed reuse activities are not known.

If the Aviation with Mixed Use Alternative were implemented, each separate organization would be responsible for the management of hazardous materials according to applicable regulations. Additionally, each organization would have to comply with EPCRA, Section 311, Title III and 10 CSR 24-4, which require that local communities be informed of the use of hazardous materials.

4.3.3.2 Hazardous Waste Management. Hazardous wastes would be generated under the Aviation with Mixed Use Alternative from the hazardous materials and the processes that utilize those materials. These wastes include solvents, paints, thinners, heavy metals, oils and batteries. The individual organizations generating hazardous wastes would also have responsibility for managing those wastes. Their responsibilities include worker training requirements under OSHA regulations (29 CFR 1901-1926), emergency planning under 10 CSR 24-4, and hazardous waste generation regulations under 10 CSR 25.

The presence of numerous independent owners/operators on the base would increase the number of hazardous waste generators subject to regulatory requirements and correspondingly increase the regulatory burden relative to hazardous waste management. However, hazardous waste management by all independent owner/operators in accordance with applicable regulations would preclude any unacceptable impacts.

4.3.3.3 Installation Restoration Program Sites. Disposal and reuse of some Richards-Gebaur AFB properties may be delayed or limited by the extent and type of contamination at IRP sites and by current and future IRP remediation activities (Figure 4.3-3). Based on the results of IRP investigations, the Air Force may, where appropriate, place limits on land reuse through deed restrictions on conveyances and use restrictions on leases. The Air Force may also retain right of access to other properties for monitoring well sampling or remedial construction and maintenance.

Determination of future base land uses will be, to a certain extent, dependent upon a regulatory review of the remedial designs and monitoring requirements of the IRP sites. This review will identify current monitoring well locations and future land use limitations as a result of their presence. The regulatory review process would include notifying the FAA concerning the construction and locations of any monitoring wells.

The IRP sites within each land use area for the Aviation with Mixed Use Alternative are summarized in Table 4.3-2 and discussed below.

Aviation Support. Regulatory acceptance of the NFAP DD for ST-007 would preclude impacts on reuse. Possible soil or groundwater remediation at SS-008 may delay property disposal and redevelopment; long-term monitoring could result in land use restrictions.

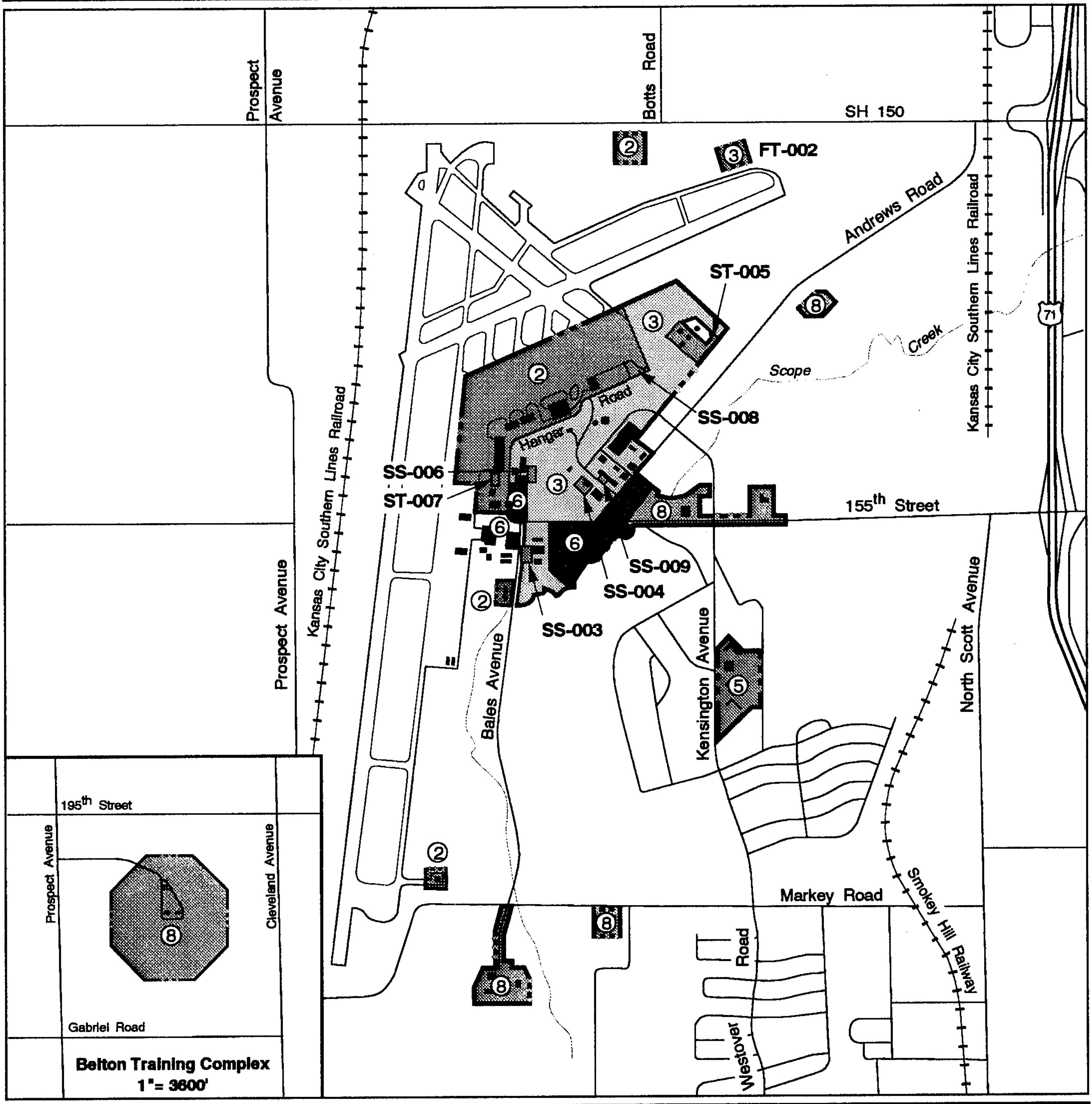
Industrial. Regulatory concurrence with the NFAP DDs for SS-003 and SS-004 would preclude impacts to reuse. Possible soil or groundwater remediation at FT-002 and SS-009, as well as planned soil remediation at ST-005, may delay property disposal and redevelopment; long-term monitoring could result in land use restrictions. Successful completion of the interim remedial action at SS-006 would preclude impacts on reuse.

Institutional (Educational). There are no identified IRP sites in this land use.

Commercial. There are no identified IRP sites in this land use.

Public Facilities/Recreation. There are no identified IRP sites in this land use.

4.3.3.4 Storage Tanks. The base plans to remove all regulated USTs, in accordance with MDNR regulations, prior to disposal. No USTs are planned for reuse. Any new USTs would be subject to applicable regulations that specify leak detection, spill and overfill protection, cathodic protection, secondary containment for the tank systems including the piping, and liability insurance. The base also plans to remove all active oil/water separators before base closure. Aviation support operations and new industry would require the use of ASTs. Reused and new ASTs would be subject to applicable federal, state, and local regulations. ASTs that would



EXPLANATION

- ① Airfield *
- ② Aviation Support
- ③ Industrial
- ④ Institutional (Medical) *
- ⑤ Institutional (Educational)
- ⑥ Commercial
- ⑦ Residential *
- ⑧ Public Facilities/ Recreation
- ⑨ Agriculture *
- IRP Site
- Base Boundary

0 500 1000 2000 Feet

* Standard land use designation not applicable to this figure.

IRP Sites - Aviation with Mixed Use Alternative

Figure 4.3-3

not be utilized to support the reuse activities would be closed in accordance with state Fire Marshal's standards.

4.3.3.5 Asbestos. Renovation and demolition of existing structures with ACM may occur with reuse and development. Such activities would be subject to all applicable federal, state, and local regulations to minimize potential risks to human health and the environment.

4.3.3.6 Pesticide Usage. The level of use and applications of pesticides would be greater than that under closure conditions due to the increase of development in the commercial and industrial areas. Management practices would be subject to FIFRA and the Missouri Department of Agriculture regulations under State Statute 281; therefore, no unacceptable impacts would result.

4.3.3.7 Polychlorinated Biphenyls. There is no federally or state-regulated PCB equipment or PCB-contaminated equipment on Richards-Gebaur AFB. Therefore, PCBs would not create any impacts to reuse and development.

4.3.3.8 Radon. Although it is possible that radon may be present in levels exceeding 4 pCi/l on base, radon should pose no impacts to reuse under the Aviation with Mixed Use Alternative because no residential uses are proposed.

4.3.3.9 Medical/Biohazardous Waste. All remaining medical/biohazardous wastes will be removed prior to base closure. Under the Aviation with Mixed Use Alternative there would be no medical reuse; therefore, no medical/biohazardous waste would be generated.

4.3.3.10 Ordnance. Ordnance will be removed from the Weapons Bunker prior to base closure. Richards-Gebaur AFB does not currently and has not historically operated an explosive ordnance disposal range. Ordnance should not impact reuse activities. If the Small Arms Range is reused, appropriate maintenance procedures would be necessary to remove bullets regularly to prevent contamination of the earthen berms.

4.3.3.11 Lead-Based Paint. Base reuse and development proposals may involve the demolition or renovation of existing structures that may contain lead-based paints. Lead-based paint would be removed and disposed in these facilities in accordance with applicable federal, state, and local regulations to minimize potential risks to human health and the environment. Reuse of the dormitories in the Billeting Complex as part of the institutional (educational) use could result in exposure to lead-based paint. The potential presence of lead-based paint in facilities constructed prior to 1978 would be disclosed to the new owners.

4.3.3.12 Mitigation Measures. Mitigation measures for this alternative would be similar to those identified in the Proposed Action.

4.3.4 Industrial Alternative

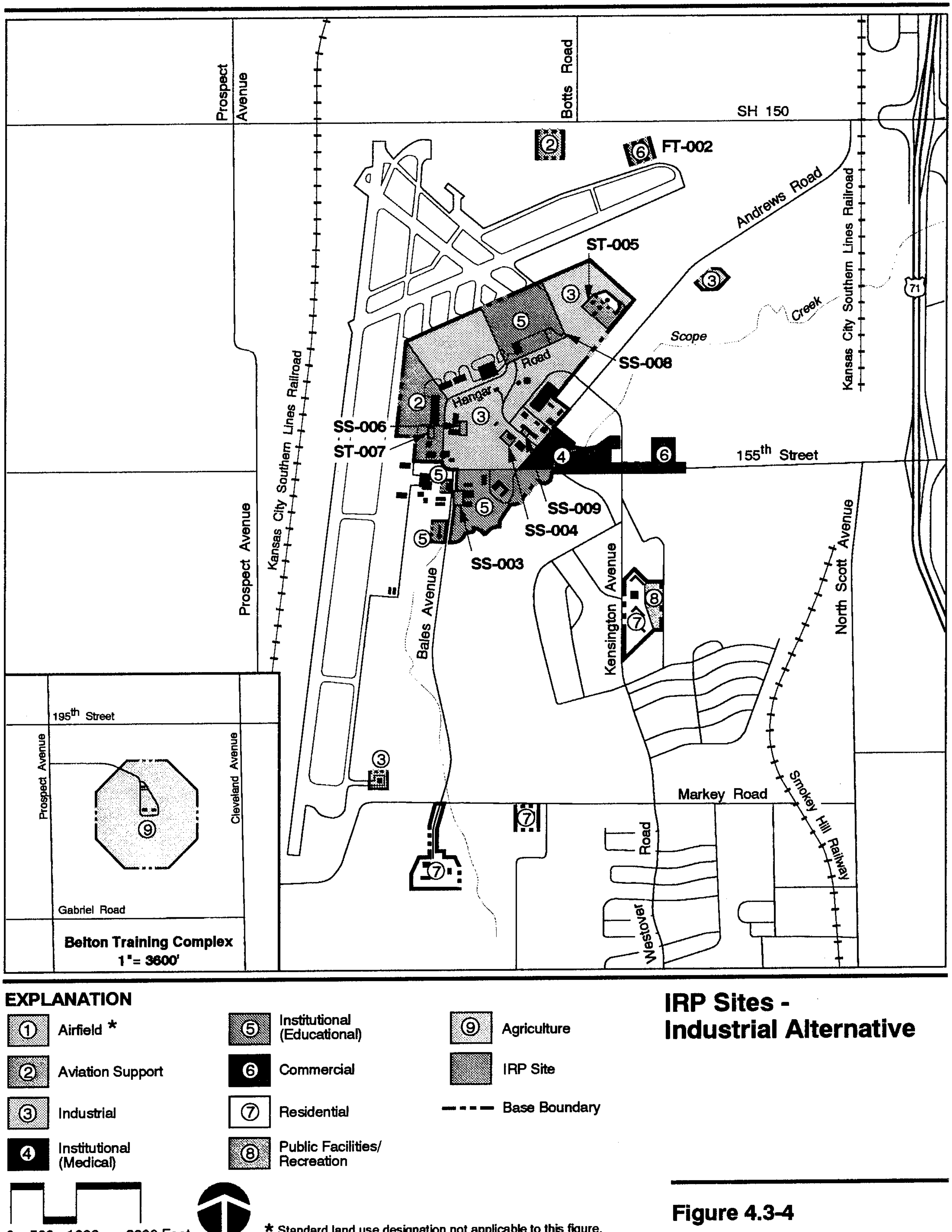
4.3.4.1 Hazardous Materials Management. The hazardous materials likely to be utilized for the activities occupying the proposed land use zones would be similar to those for the Proposed Action (see Table 4.3-1). The types of hazardous materials used would be typical of industrial operations as well as aircraft maintenance and servicing operations, similar to those currently used by the base. New industries could introduce the use of hazardous materials different from those in use prior to closure. The quantity of hazardous materials utilized under this alternative would be greater than that under closure conditions due to the increase of new industries and the continued use of aviation support buildings. The specific chemical compositions and exact use rates associated with the proposed reuse activities are not known.

If the Industrial Alternative were implemented, each separate organization would be responsible for the management of hazardous materials according to applicable regulations. Additionally, each organization would have to comply with EPCRA, Section 311, Title III and 10 CSR 24-4, which require that local communities be informed of the use of hazardous materials.

4.3.4.2 Hazardous Waste Management. Hazardous wastes would be generated under the Industrial Alternative from the hazardous materials and the processes that utilize those materials. These wastes include solvents, paints, thinners, heavy metals, oils, and batteries. The responsibilities for managing hazardous wastes would fall under the control of the individual organizations generating the wastes. These responsibilities include worker training requirements under OSHA regulations (29 CFR 1901-1926), emergency planning under 10 CSR 24-4, as well as hazardous waste generation regulations under 10 CSR 25.

The presence of numerous independent owners/operators on the base would increase the number of hazardous waste generators subject to regulatory requirements and correspondingly increase the regulatory burden relative to hazardous waste management. However, hazardous waste management by all independent owners/operators in accordance with applicable regulations would preclude any unacceptable impacts.

4.3.4.3 Installation Restoration Program Sites. Disposal and reuse of some Richards-Gebaur AFB properties may be delayed or limited by the extent and type of contamination at IRP sites and by current and future IRP remediation activities (Figure 4.3-4). Based on the results of IRP investigations, the Air Force may, where appropriate, place limits on land reuse through deed restrictions on conveyances and use restrictions on leases. The Air Force



IRP Sites - Industrial Alternative

Figure 4.3-4

may also retain right of access to other properties for monitoring well sampling or remedial construction and maintenance.

The IRP sites within each land use area for the Industrial Alternative are discussed below and summarized in Table 4.3-2.

Aviation Support. Regulatory acceptance of the NFAP DD for ST-007 would preclude impacts on reuse.

Industrial. Regulatory concurrence with the NFAP DD for SS-004 would preclude impacts to reuse. Successful completion of the interim remedial action at SS-006 would preclude impacts to reuse. Possible soil or groundwater remediation at SS-009 and the planned soil remediation at ST-005 may delay property disposal and redevelopment; long-term monitoring could result in land use restrictions.

Institutional (Medical). There are no identified IRP sites in this land use.

Institutional (Educational). Regulatory concurrence with the NFAP DD for SS-003 would preclude impacts to reuse. Possible soil or groundwater remediation at SS-008 may delay property disposal and redevelopment; long-term monitoring could result in land use restrictions.

Commercial. Possible soil or groundwater remediation at FT-002 may delay property disposal and redevelopment; long-term monitoring could result in land use restrictions.

Residential. There are no identified IRP sites in the residential land use.

Public Facilities/Recreation. There are no identified IRP sites in this land use.

Agriculture. There are no identified IRP sites in the agriculture land use.

4.3.4.4 Storage Tanks. The base plans to remove all regulated USTs, in accordance with MDNR regulations, prior to disposal. No USTs are planned for reuse. Any new USTs would be subject to applicable regulations that specify leak detection, spill and overfill protection, cathodic protection, secondary containment for the tank systems including the piping, and liability insurance. The base also plans to remove all active oil/water separators before base closure. Aviation support operations and new industry would require the use of ASTs. Reused and new ASTs would be subject to applicable federal, state, and local regulations. ASTs that would not be utilized to support the reuse activities would be closed in accordance with state Fire Marshal's standards.

4.3.4.5 Asbestos. Renovation and demolition of existing structures with ACM may occur with reuse and development. Such activities would be subject to all applicable federal, state, and local regulations to minimize potential risks to human health and the environment.

4.3.4.6 Pesticide Usage. Pesticide usage associated with the Industrial Alternative would be greater than amounts used under closure baseline conditions as a result of increased landscaping of open land in the industrial areas as well as the agricultural use of the Belton Training Complex. Management practices relating to pesticides are subject to FIFRA and the Missouri Department of Agriculture regulations under State Statute 281; therefore, no unacceptable impacts would result.

4.3.4.7 Polychlorinated Biphenyls. There is no federally or state regulated PCB equipment or PCB-contaminated equipment on Richards-Gebaur AFB. Therefore, PCBs would not create any impacts to reuse and redevelopment.

4.3.4.8 Radon. It is possible that radon may be present in levels exceeding 4 pCi/l on base and should be considered in the construction design of any new residential structures to limit the potential for exposure. Further, new owners of the dormitories in the Billeting Complex should perform radon testing prior to use of the structures to determine if mitigation measures are necessary.

4.3.4.9 Medical/Biohazardous Waste. With the establishment of the institutional (medical) land use, amounts of medical waste will increase over the closure baseline. Management of infectious wastes is regulated under 10 CSR 80-7. No unacceptable impacts would be associated with this increased activity.

4.3.4.10 Ordnance. Ordnance will be removed from the Weapons Bunker prior to base closure. Richards-Gebaur AFB does not currently and has not historically operated an explosive ordnance disposal range. Ordnance should not impact reuse activities.

An investigation of soils at the Small Arms Range determined that lead concentrations were below regulatory action levels and no remediation is necessary. Therefore, there will be no lead impacts on reuse associated with the range.

4.3.4.11 Lead-Based Paint. Base reuse and development proposals may involve the demolition or renovation of existing structures that may contain lead-based paints. Lead-based paint would be removed and disposed in these facilities in accordance with applicable federal, state, and local regulations to minimize potential risks to human health and the environment. Residential reuse of the dormitories could result in exposure to lead-based

paint. The potential presence of lead-based paint in facilities constructed prior to 1978 would be disclosed to the new owners.

4.3.4.12 Mitigation Measures. Mitigation measures for this alternative would be similar to those identified in the Aviation Alternative.

4.3.5 No-Action Alternative

Painting and maintenance would be the primary activities under this alternative that would involve hazardous materials. The OL would manage all waste generated in accordance with applicable regulations, as well as the final phases of the IRP activities.

4.3.5.1 Hazardous Materials Management. Hazardous materials would be utilized in preventive and regular maintenance activities, grounds maintenance, and water and wastewater treatment. The materials used for these activities would include pesticides, fuels, paints, and corrosives. The OL would be responsible for hazardous materials handling training, as well as hazardous materials communication requirements of OSHA regulations. Quantities of hazardous materials would be similar to those used at closure.

4.3.5.2 Hazardous Waste Management. With the exception of facilities utilized by OL personnel, all satellite accumulation points would be closed and all the hazardous waste disposed of prior to closure. In view of the small amount of hazardous waste that would be generated under the No-Action Alternative, the OL would remain an SQG. The OL must comply with all RCRA and state regulations.

4.3.5.3 Installation Restoration Program Sites. Ongoing sampling and remedial design activities would be continued by the individual IRP contractors. The OL would manage and support the requirements for these contractors.

4.3.5.4 Storage Tanks. The base plans to remove all regulated USTs prior to disposal. The ASTs would be purged of fuel fumes to preclude fire hazards. The state Fire Marshal may order the removal of tanks that are out of service. The OL would provide repair and general maintenance for the ASTs and associated piping.

4.3.5.5 Asbestos. The impacts from the No-Action Alternative would be minimal. Vacated buildings would be secured to prevent contact with ACM. Management of ACM would be accomplished to ensure a safe site environment.

4.3.5.6 Pesticide Usage. Under the No-Action Alternative, the grounds and structures would be maintained in such a manner as to facilitate economic resumption of use. Application of pesticides would be conducted in

accordance with FIFRA and state regulations to assure the proper and safe handling and application of all chemicals.

4.3.5.7 Polychlorinated Biphenyls. There is no federally or state-regulated PCB equipment or PCB-contaminated equipment on Richards-Gebaur AFB. Therefore, PCBs would not create any impacts under the No-Action Alternative.

4.3.5.8 Radon. Because there would be no residential use of any on-base structures under the No-Action Alternative, there would be no radon impacts.

4.3.5.9 Medical/Biohazardous Waste. All existing materials will be removed prior to closure; therefore, these materials would not create any impacts under the No-Action Alternative.

4.3.5.10 Ordnance. Ordnance will be removed from the Weapons Bunker prior to base closure. Ordnance at Richards-Gebaur AFB should have no impact on the No-Action Alternative. Investigations of soil contamination at the Small Arms Range have determined that no remediation is necessary.

4.3.5.11 Lead-Based Paint. Vacated buildings would be managed to prevent exposure to lead-based paint. Lead-based paint should have no impact on the No-Action Alternative.

4.3.5.12 Mitigation Measures. Under the No-Action Alternative, contingency plans developed to address spill response would be less extensive than those required for any of the reuse alternatives. Implementation of such procedures could effectively mitigate any potential impacts associated with the No-Action Alternative.

4.4 NATURAL ENVIRONMENT

This section describes the potential effects of the reuse alternatives on the natural resources of geology and soils, water resources, air quality, noise, biological resources, and cultural resources in the base area and surrounding region.

4.4.1 Geology and Soils

The potential effects of the reuse alternatives on the local geology and soils have been analyzed based on review of published literature. For those aspects of physical resources that are governed by regulation (e.g., farmland protection), the project activities are considered in terms of regulatory requirements. For the majority of the components of physical resources, for which there are no specific regulatory conditions, impacts are defined by the amount of change to the natural environment caused by each alternative.

4.4.1.1 Proposed Action. The Proposed Action is projected to have minimal impacts regarding geologic resources; the area is likely to present some engineering/design considerations or constraints in geotechnical and soils resource areas.

Geology. The terrain that would be disturbed on Richards-Gebaur AFB represents a small fraction of the region's natural terrain and is not unique when compared to the rest of the region. Therefore, the loss of small areas of natural landforms would represent only a minor impact.

Construction associated with development under the Proposed Action would cause additional demand for aggregate. However, local sources of sand and limestone are plentiful; therefore, minimal impact is projected.

Additional development of the area as a result of the Proposed Action may cause some oil and gas reserves in the area to become inaccessible; however, these impacts are projected to be minor because the area has only limited potential for providing economic quantities and quality of product.

Based on the seismic character of the area, impacts associated with earthquakes and the Proposed Action are considered to be minimal. Design of facilities according to applicable Uniform Building Code Standards for seismic zone 2B would reduce potential effects from local seismic events.

The possibility of impacts from induced ground collapse (caused by weakening of rock/soil above subsurface void space) is not considered to be likely because the only known event (the Belton Ring-Fault Complex) is not a recent event, and because soil borings on Richards-Gebaur AFB (with depths ranging from 2.5 feet to 89 feet) have not identified void spaces. However, this hazard should be considered during project planning/design prior to construction activities.

Soils. As described in Section 3.4.1.2, most of the soils on Richards-Gebaur AFB have characteristics resulting in severe restrictions in siting sanitary facilities (in particular, septic tank absorption fields and sewage lagoon areas) (U.S. Department of Agriculture, 1984, 1985). As a result, construction of new facilities in these soil types would cause impacts if the design included these features on site. Potential results of using septic tank absorption fields in unsuitable soils include:

- Inefficient (poor quality) treatment of effluent
- Surfacing of effluent, causing potential health, odor, and economic impacts
- Contamination (bacteria, nitrate-nitrogen, and chloride) of shallow groundwater aquifers, some of which may be used by

residences for water supply. Soils developed on loess (see Table 3.4-1), and related water supply, are particularly susceptible to contamination from waste-disposal systems (Duley, 1983).

Impacts from soil erosion (during construction activities such as grading, excavating, and contouring the soils on a total of 83 acres) would be short term. During construction, grading activities and removal of vegetative cover would increase the potential for erosion by wind and water. However, once the construction phase is complete, most areas would be covered with pavement or landscaping, thus reducing the erosion potential.

The Farmland Conversion Impact Rating Form (U.S. Department of Agriculture Form AD 1006) for the closure and reuse of Richards-Gebaur AFB, and a related summary of the scoring process, are included in Appendix K. None of the soils in the Cantonment Area and vicinity are of concern because they are all considered to be urban area, and as such, not subject to the provisions of the Farmland Protection Policy Act (FPPA) (7 U.S.C. §§4201 et seq.). However, all of the soils in the Belton Training Complex are considered to be either Prime or Statewide/Local Important Farmlands (Table 4.4-1). Under the Proposed Action, the U.S. Army Reserve would continue to train at the Belton Training Complex. This use would be the same as under preclosure conditions. Therefore, no conversion of Prime of Statewide/Local Important farmlands would take place and the provisions of the FPPA would not be applicable.

Table 4.4-1. Soil Type, Acreage, and Status of Farmland to be Converted at the Belton Training Complex

Soil Type	Acreage to be Converted	Farmland Status
Greenton silty clay loam, 5 to 9% slopes	92.5	Statewide or Local Important Farmland
Nowata Variant silt loam, 5 to 9% slopes	35.3	Statewide or Local Important Farmland
Macksburg silt loam, 2 to 5% slopes	56.2	Prime Farmland
Total Acreage	184.0	

Note: All acres to be converted are located at the Belton Training Complex.
Sources: Appendix K; U.S. Department of Agriculture, 1985.

Cumulative Impacts. No cumulative effects to geology and soils from other projects in the ROI have been identified.

Mitigation Measures. Mitigation measures for geology and soils resource areas are primarily preventative in nature; by planning specific designs, actions, etc., into construction and operations, level of impacts or the probability of impact can be reduced. Mitigation measures that could be implemented include:

- Add protective covering (during construction) such as mulch or straw, or use water to wet exposed soils (to reduce wind erosion).

- Limit the amount of area disturbed and the length of time that areas are exposed (to reduce wind and water erosion).

- Construct drainage systems around construction areas to divert water from eroding exposed soils.

- Review available data and perform pre-construction tests to determine possibility of subsurface voids prior to ground-disturbing activities (primarily for sites with shallow limestone bedrock).

- Connect to nearby sewer systems or use alternative designs of septic tank effluent treatment systems (e.g., as described in Duley, 1983) to reduce potential impacts in unsuitable soils.

4.4.1.2 Aviation Alternative. Impacts from the Aviation Alternative to soils and geology would be similar to those from the Proposed Action, with the exception of the conversion of the Belton Training Complex to residential use.

The residential reuse of the Belton Training Complex may require the use of septic tank systems because sewer systems are not currently available adjacent to the property. Therefore, the potential for impacts because of unsuitable soils (see Section 4.4.1.1) would be higher than that of the Proposed Action.

The amount of acreage disturbed by construction activities under the Aviation Alternative would be similar to that disturbed by Proposed Action activities. Therefore, soil loss levels would also be similar.

Because the Aviation Alternative proposes that the Belton Training Complex be converted to residential land use, Form AD 1006, which is established by regulations implementing the FPPA, was used to score and rank this alternative based on a 260-point system. Sites/alternatives scoring less than 160 points should be given a minimal level of consideration for farmland protection in the decision-making process; those with scores of 160-260 should be given increasing levels of consideration. The farmland protection

score for the Aviation Alternative (Form AD 1006, Appendix K) is 159.9. Because this score is below 160 points, farmland protection should be given a low level of consideration.

Cumulative Impacts. No programs that might result in cumulative effects to geology and soils in the ROI have been identified.

Mitigation Measures. Mitigation measures for this alternative would be the same as for the Proposed Action.

4.4.1.3 Aviation with Mixed Use Alternative. Impacts to geology and soils from the Aviation with Mixed Use Alternative would be virtually identical to those from the Proposed Action, with minor differences in soil capability, soil erosion and farmland protection.

The public facilities/recreation reuse of the Belton Training Complex would require at most a few septic tank treatment systems. Therefore, the potential for impact because of unsuitable soils would be higher than that for the Proposed Action.

The Aviation with Mixed Use Alternative would have slightly more acres disturbed by construction activities than the Proposed Action. As a result, slightly higher levels of soil loss could occur from implementation of this alternative.

Because the Aviation with Mixed Use Alternative proposes that the Belton Training Complex be converted to public facilities/recreation land use, the farmland protection score (Form AD 1006, Appendix K) is 155.9. Because this score is below the 160 point level of importance, impacts from loss of Prime Farmland are considered to be minor.

Cumulative Impacts. No cumulative effects to geology and soils from other projects in the ROI have been identified.

Mitigation Measures. Mitigation measures for this alternative would be the same as for the Proposed Action.

4.4.1.4 Industrial Alternative. Most of the impacts to geology and soils from the Industrial Alternative would be the same as those from the Proposed Action with some differences in soil capability, soil erosion, and farmland protection.

Because the Belton Training Complex would be used as agricultural area, the need for septic tank wastewater treatment systems would be greatly reduced or eliminated. Therefore, related impacts would be less likely than as described in Section 4.4.1.1.

The Industrial Alternative would have more acres of ground disturbed by construction activities than the Proposed Action. As a result, proportionally higher levels of soil erosion are expected from implementation of this alternative. Because plowing and irrigating activities are not proposed as part of the agricultural use in the Belton Training Complex, impacts from erosion at that parcel would be minimal.

Under the Industrial Alternative, the Belton Training Complex would be converted to agricultural land, and the land would be protected as farmland. Because all of the soils in the Belton Training Complex are classified as either Prime Farmland or Statewide/Local Important Farmland, this alternative would cause a beneficial impact in terms of the FPPA.

Cumulative Impacts. No cumulative effects to geology and soils from other projects in the ROI have been identified.

Mitigation Measures. Mitigation measures for this alternative would be the same as for the Proposed Action.

4.4.1.5 No-Action Alternative. The limited activities associated with the No-Action Alternative would result in no impacts for all aspects of geology and soils. No cumulative effects would occur, and no mitigation measures would be required.

4.4.2 Water Resources

The alternatives were considered for potential environmental impacts to water resources. The primary criterion for identification of impacts was the comparison of project effects to regulatory requirements. The secondary criterion for impact identification was the amount of change caused by the alternatives to various aspects of water resources.

4.4.2.1 Proposed Action

Surface Water. As described in Section 4.2.4.1, total project demand under the Proposed Action would represent an increase of less than 0.3 percent over projected regional use in 2014 (Section 4.2.4). All of this demand would be met by existing Missouri River water sources provided by the Kansas City Water and Pollution Control Department.

Construction activities associated with the development of new facilities as part of reuse would likely result in some changes to local surface drainage (e.g., increased runoff from increased impermeable area, minor configuration changes to secondary channels, or local ponding from changes in grade). Because all surface drainage is intermittent in nature (including Scope Creek), increases to water velocity, sediment loads, and related conditions are expected to cause minimal impacts. Also, because no surface

impoundments, changes in the course of perennial streams, or other major waterway changes are planned, no related impacts are expected.

Because there are no 100-year floodplains on Richards-Gebaur AFB, no impacts (or related activities required by Executive Order 11988, Floodplain Management) are projected.

Wetlands are discussed in Section 4.4.5.

Water Quality. The actions associated with the Proposed Action should cause limited impacts to water quality. Because Missouri River sources meet drinking water standards (following in-place treatment processes), no water quality impacts related to public drinking water are projected.

As discussed in Section 3.4.2.3, the base's application for a NPDES nonpoint source permit for storm water discharges into Scope Creek is under review by MDNR. Because Scope Creek is a tributary of the Little Blue River (which is classified as a Metropolitan No-Discharge Stream under Missouri water quality regulations), storm water runoff from Richards-Gebaur AFB would need to comply with Missouri Water Quality Standards (10 CSR 20-7.031) for Metropolitan No-Discharge Streams as part of the NPDES compliance process.

Discharges related to reuse would be limited to storm water runoff (where the storm water contains some level of contamination from flowing over oil-stained pavement, painted surfaces of buildings, etc.), and would be similar to current conditions. Based on recent analysis of runoff, relatively low levels of contamination from the Proposed Action are projected. Continued compliance with existing NPDES and state requirements should minimize the associated water quality impacts. Coordination between MDNR and the reuse agencies would be required to determine whether the base NPDES permit would be transferred and whether new, additional permits (for multiple operators in the aviation/industrial areas) would be needed, and to identify specific procedural requirements associated with compliance.

Groundwater. As discussed in Section 3.4.2.4, most of the groundwater supply in the region is not potable; as a result, use of groundwater as a drinking water supply is limited to some domestic water supply wells that tap into shallow perched aquifers or low-flow shallow bedrock aquifers. It is assumed that water to supply any new development considered under the Proposed Action would be provided via current base systems. Because the Proposed Action would not install or use water wells for water supply, no related impacts are expected. Potential impacts from use of septic tank absorption fields in unsuitable soil types (and the relationship to groundwater quality) are discussed in Section 4.4.1.

Existing groundwater issues in context of existing base contamination are discussed in Section 4.3.

Cumulative Impacts. Realignment of M-150 immediately north of Richards-Gebaur AFB will require water as part of construction activities. However, both the M-150 construction and the Proposed Action would require small amounts of water compared to the plentiful supply. Therefore, cumulative impacts are not expected.

Mitigation Measures. Measures discussed in Section 4.4.1.1 to reduce erosion by runoff would also help reduce potential runoff effects in water resources.

4.4.2.2 Aviation Alternative

Surface Water. Impacts related to surface water would be similar to those for the Proposed Action. Reuse-related water use would represent less than 0.1 percent of the total projected ROI water use; therefore, impacts to water supply are expected to be minimal throughout the redevelopment period.

Water quality issues associated with storm water runoff and NPDES permitting would be the same as for the Proposed Action.

Residential reuse of the Belton Training Complex would result in minimal discharge of contaminants in storm water that would eventually reach the Harry S. Truman Reservoir. Private residences are not subject to NPDES or state water quality permit requirements.

Groundwater. It is assumed that water to supply the residential development at the Belton Training Complex would be provided via connection to nearby mains in the Cass County Water Supply District No. 2 system. As for the Proposed Action, no use of groundwater is anticipated, and impacts to groundwater resources from the Aviation Alterative are expected to be minimal or none.

Cumulative Impacts. Cumulative effects would be the same as under the Proposed Action.

Mitigation Measures. Mitigation measures would be the same as for the Proposed Action.

4.4.2.3 Aviation with Mixed Use Alternative

Surface Water. Impacts related to surface water would be similar to those for the Proposed Action. Reuse-related water use would represent less than 0.1 percent of total projected ROI use; therefore, impacts to water supply are expected to be minimal throughout the redevelopment period.

Water quality issues associated with storm water runoff and NPDES permitting would be the same as for the Proposed Action.

Public facilities/recreation reuse at the Belton Training Complex would result in discharge of minimal amounts of contaminants that could be introduced into storm water that ultimately discharges into the Harry S. Truman Reservoir.

Groundwater. As with the Proposed Action impacts to groundwater resources from the Aviation with Mixed Use Alternative are expected to be minimal or none.

Cumulative Impacts. Cumulative effects would be virtually the same as for the Proposed Action.

Mitigation Measures. Mitigation measures would be the same as for the Proposed Action.

4.4.2.4 Industrial Alternative

Surface Water. Impacts related to surface water would be similar to those for the Proposed Action. Reuse-related water use would represent less than 0.1 percent of projected total ROI use; therefore, impacts to water supply are projected to be minimal throughout the redevelopment period.

Water quality issues associated with storm water runoff and NPDES permitting would be the same as for the Proposed Action.

As agricultural land, the Belton Training Complex may be the source of some pesticides and related chemicals being introduced into storm water runoff. Therefore, impacts to surface water from runoff would be similar to those of the Proposed Action.

Groundwater. As with the Proposed Action, no use of groundwater is anticipated, and impacts to groundwater resources from the Industrial Alternative are expected to be minimal or none.

Cumulative Impacts. Cumulative effects would be virtually the same as for the Proposed Action.

Mitigation Measures. Mitigation measures would be the same as for the Aviation Alternative.

4.4.2.5 No-Action Alternative. Impacts from the No-Action Alternative on surface water and groundwater resources are expected to be negligible. The Air Force would continue its current point location water quality sampling/analysis program, or follow applicable activities after the NPDES

permit application review process is completed. Due to the minimal activity associated with the No-Action Alternative, impacts to water quality would be minimal. There would be no cumulative impacts and no mitigation measures would be required.

4.4.3 Air Quality

Air quality impacts would occur during construction and operation associated with the reuse alternatives for Richards-Gebaur AFB. Intermittent construction-related impacts would result from fugitive dust (particulate matter) and construction equipment emissions. Operational impacts would occur from (1) mobile sources such as aircraft, aircraft operation support equipment, commercial transport vehicles, and personal vehicles; (2) point sources such as heating/power plants, generators, incinerators and storage tanks; and (3) secondary emission sources associated with population increase, such as residential heating.

The methods selected to analyze impacts depend upon the type of emission source being examined. Air quality analytical methods are summarized here and presented in detail in Appendix J. Analysis during the construction phase consists of estimating the amount of uncontrolled fugitive dust emitted from disturbed areas and the combustion emissions associated with construction equipment. Analysis for point source and secondary source emissions during the operation phase consists of quantifying the emissions associated with the airport, and site-related population. These emissions are then evaluated to determine how they would affect the maintenance of the NAAQS.

Ambient effects to local air quality are analyzed by modeling pollutant concentrations at receptor locations likely to receive maximum air quality impacts. For aviation-related alternatives, the receptors are typically selected at the downwind end of the runway to analyze the impacts from airport operations. Emissions from non-aviation activities on base would not contribute substantially to the air quality impacts at those receptor locations.

The ambient effects of aircraft emissions are analyzed by modeling with the EDMS (Segal, 1991a, b, c). Air quality modeling is presented for the Proposed Action and alternatives through 2004 (10 years of analysis after base closure). The effects of the 1990 Amendments to the CAA, such as electric and other low-emission vehicle ownership percentages, cannot be accurately predicted very far into the twenty-first century. The uncertainties of long range population and traffic projections, future changes to the CAA, and the complex interaction of meteorology with emission inventories make 20-year emission and pollution concentration projections too speculative.

The following assumptions were made in estimating the effects of the Proposed Action and alternatives:

- For construction, fugitive dust emissions were based on the acreage graded each year. Grading activity was assumed to occur 115 days per year. Combustion emissions from construction equipment were based on per-acre emission factors developed for a generic construction scenario. Construction equipment was assumed to be active 230 days per year. Four acre-days of disturbance are assumed per acre.

- EDMS was used to calculate annual aircraft emissions for the airport operations associated with preclosure, closure, and the reuse alternatives.

- Heating and power production emissions were based on per-capita emission factors developed from base-related employment data and information on emissions associated with the base heating and power production facility. Future reuse-related heating and power emissions were estimated by multiplying the base-specific per-capita heating and power emission factors by the site-related reuse population.

- Future reuse-related operation emissions from sources other than aircraft operations and heating and power production were derived using per capita emission factors developed from Cass and Jackson county emission inventory data. Future reuse-related emissions were estimated by multiplying the derived per-capita emission factors by the site-related reuse population.

The New Source Review (NSR) process is implemented in attainment areas to control pollutants and maintain attainment status. Prior to construction of any new major emitting facility (i.e., a stationary source that has the potential to emit more than 100 tons per year of any pollutant specified in the CAA), a preconstruction permit must be obtained, in accordance with CAA, 42 U.S.C. §7475. The permitting process includes an air quality analysis to determine if emissions from that source would cause the levels of any criteria pollutants to exceed the NAAQS. If the analysis reveals that there is a potential for standards to be exceeded, the applicant is required to install control technology to reduce emissions in order to maintain pollutant levels within standards.

In addition to NSR, there is an additional step in controlling emissions. Except for CO and O_3, the process by which emissions of criteria pollutants that meet NAAQS are prevented from degrading the existing ambient conditions is called PSD (CAA 42 U.S.C. §7473). The PSD process limits the allowable ambient impact of NO_2, PM_{10}, and SO_2 emissions from new or modified major stationary sources to specific increments. These increments are designed to prevent new or modified sources from causing significant degradation of an area's air quality. For PSD purposes, major stationary sources are generally defined as those sources which emit more than 100 tons per year of an attainment pollutant. Ambient impacts from new or

modified air pollution sources are generally determined through air quality modeling. While the PSD process provides adequate means for assessing and regulating impacts from stationary sources of air pollution, this process does not provide a mechanism for dealing with nonstationary sources such as motor vehicles and aircraft.

Additionally, as described in Section 3.4.3, Air Quality, by 2000, most medium- and large-sized sources of HAPs generated by potential reuse at Richards-Gebaur AFB would be required to follow U.S. EPA regulations that will control HAPs emissions. Because details about the specific type of industrial activities to be conducted under the reuse proposals are unknown, it is not possible to develop an inventory of HAP emissions for this analysis.

4.4.3.1 Proposed Action

Construction. Fugitive dust would be generated during the construction of facilities to support reuse under the Proposed Action. These emissions would be greatest during site clearing and grading activities. Uncontrolled fugitive dust (particulate matter) emissions from ground-disturbing activities are estimated to be emitted at a rate of 1.2 tons per acre per month (U.S. EPA, 1985). The PM_{10} fraction of the total fugitive dust emissions is assumed to be 50 percent, or 0.6 ton per acre per month.

Construction activities would disturb an average of 4.4 acres per year from 1994 to 1999 and an average of 4.0 acres per year from 1999 to 2004. The total fugitive PM_{10} emissions from construction activity would be 0.48 and 0.44 ton per year for these two time periods, respectively. These PM_{10} emissions would cause elevated short-term concentrations at receptors close to the construction areas. However, the elevated concentrations would be temporary and would fall off rapidly with distance.

Combustive emissions from construction equipment associated with the Proposed Action and alternatives were calculated based on an average construction emission factors and the amount of land to be developed per time interval. For each acre of land developed, 0.15 ton of VOC, 0.55 ton of NO_x, 1.91 tons of CO, 0.05 ton of SO_x, and 0.04 ton of PM_{10} would be emitted from construction equipment. The total combustive emissions due to construction were estimated to be 0.64 ton per year of VOC, 2.41 tons per year of NO_x, 8.40 tons per year of CO, 0.22 ton per year of SO_x, and 0.19 ton per year of PM_{10} during the time period from 1994 to 1999. Emissions of VOC, NO_x, CO, SO_x, and PM_{10} in the period from 1999 to 2004 would be 0.58 ton per year, 2.19 tons per year, 7.64 tons per year, 0.20 ton per year, and 0.17 ton per year, respectively.

Operation. A summary of construction and operation emissions for the Proposed Action is presented in Table 4.4-2. Aircraft operation emissions were calculated using the EDMS model. Estimates for all other categories of

Table 4.4-2. Emissions Associated with the Proposed Action and Alternatives (tons/year)

Pollutant	Cass/ Jackson Counties[a] Preclosure 1992	Base-related Emissions[b] Preclosure 1992	Base-related Emissions[b] Closure 1994	Proposed Action[c] 1999	Proposed Action[c] 2004	Aviation Alternative[c] 1999	Aviation Alternative[c] 2004	Aviation with Mixed Use Alternative[c] 1999	Aviation with Mixed Use Alternative[c] 2004	Industrial Alternative[c] 1999	Industrial Alternative[c] 2004
VOC	26,713	97	8	57	108	113	132	101	123	83	108
NO_x	53,165	96	6	96	157	165	198	140	162	119	146
CO	1,174	154	113	158	212	183	226	213	246	165	171
SO_2	59,271	12	1	16	27	26	33	24	30	24	30
PM_{10}	2,148	8	1	7	11	12	14	11	13	8	10

Notes: (a) Emissions are based on 1990 inventory data from the MDNR (1993c) and the Kansas City Ozone State Implementation Plan (MDNR, 1988).
(b) Base-related emissions include emissions from both direct and indirect sources (refer to Appendix J for calculation methodology).
(c) Reuse-related emissions include emissions from construction sources and direct and indirect operation sources (refer to Appendix J for calculation methodology).

CO = carbon monoxide.
MDNR = Missouri Department of Natural Resources.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

emissions were calculated using the per-capita forecasting methodology described in Appendix J.

Potential impacts to air quality as a result of operational emissions from the Proposed Action were evaluated in terms of two spatial scales: regional and local. The regional-scale analysis considered the potential for total project emissions to cause the ROI to become nonattainment for any criteria pollutant as indicated by large increases in the regional pollutant inventories (VOC, NO_2, CO, SO_2, and PM_{10} emissions). The local-scale analysis evaluated the potential for aircraft emissions to exceed the NAAQS in the immediate vicinity of the base.

Regional Scale. It is not expected that the Proposed Action would interfere with maintenance of the current attainment status for any pollutant. The regional scale impact of each pollutant is discussed below.

Ozone Precursors. Table 4.4-2 provides a comparison of emission estimates for Cass and Jackson counties (preclosure), Richards-Gebaur AFB (preclosure and closure), and the Proposed Action at 5- and 10-year increments after closure. Base-related emissions include the direct emissions at Richards-Gebaur AFB (see Section 3.4.3.2), as well as the indirect emissions associated with the base activities (see Appendix J). Similarly, the reuse-related emissions include both direct and indirect emissions associated with the Proposed Action. The reuse-related emissions of ozone precursors (VOC and NO_x) would be less than or equal to emissions under preclosure conditions, and greater than emissions at closure; the increase from closure would represent less than 0.5 percent of total VOC and NO_x emissions in Cass and Jackson counties. Therefore, the Proposed Action would not interfere with maintaining attainment of the ozone standard.

NO_2, CO, SO_2, and PM_{10}. Table 4.4-2 provides a means to compare emissions related to the Proposed Action to 1992 Cass and Jackson counties emissions and base preclosure and closure emission levels. All NO_x emissions in Table 4.4-2 are assumed to convert to NO_2 emissions on a regional basis. Reuse-related emissions of PM_{10} in 1999 would be less than under preclosure conditions. Other emissions associated with reuse would be greater than emissions under either preclosure or closure conditions, but the increase would represent only a small fraction of the total ROI emissions. Further, because the emissions shown in Table 4.4-2 for Jackson and Cass counties do not include area or mobile source emissions for PM_{10}, SO_2, or CO, total emissions in the ROI are actually higher than indicated in Table 4.4-2. Because the increase in emissions under reuse would represent only a small fraction of total ROI emissions, and because the area is currently in attainment of all standards, it is not expected that the Proposed Action would interfere with maintaining attainment of air quality standards.

Local Scale. A summary of the EDMS analysis for the Proposed Action is presented in Table 4.4-3. The modeling results show that during peak hours of airport operation, the maximum 1-hour pollutant concentrations would occur at a receptor located at the north end of the main runway. The primary contributing factor would be aircraft exhaust emitted during takeoffs. The modeling results indicate that concentrations would not exceed the NAAQS in the immediate area surrounding the airport. Emissions from airport activities under the Proposed Action would, therefore, have no adverse impact on the local air quality.

Mitigation Measures. Implementation of the Proposed Action would result in no impacts to regional or local air quality; therefore, no mitigation measures would be required. However, measures could be put in place to reduce short-term localized fugitive dust emissions from ground-disturbing activities and combustive emissions from construction equipment. Application of water during ground-disturbing activities is estimated to reduce fugitive dust emissions by at least 50 percent (U.S. EPA, 1985). Other measures such as reducing vehicle speeds and paving dirt roads could reduce dust emissions as well. Combustion emission effects could be reduced by efficient scheduling of equipment use, reducing the number of units operating simultaneously, and performing regular vehicle engine maintenance.

Conformity with State/Local Plans. NEPA requires that agencies identify any inconsistency of a proposed action with any approved state or local plans and laws. As stated above, emissions from the Proposed Action are not expected to have an adverse impact on local or regional air quality and, therefore, are not expected to interfere with the attainment status of the region. In relation to this issue, U.S. EPA has promulgated detailed procedures for determining conformity with state and local air quality plans for nonattainment areas (40 CFR 51.853[b]). Under the existing rule, transfers of ownership interest in property (i.e., the Air Force's actions) are exempt from the conformity requirement. However, if U.S. EPA promulgates conformity procedures in attainment areas, property recipients may be required to prepare a conformity determination on their actions.

4.4.3.2 Aviation Alternative

Construction. Uncontrolled fugitive dust (particulate matter) emissions from ground-disturbing activities were estimated using the same methodology and assumptions as previously described for the Proposed Action. Construction activities would disturb an average of 7.6 acres per year from 1994 to 1999 and an average of 6.4 acres per year from 1999 to 2004. The total fugitive PM_{10} emissions from construction activity would be 0.8 and 0.7 ton per year for these two time periods, respectively. These PM_{10} emissions would cause elevated short-term concentrations at receptors close to the construction areas. However, the elevated concentrations would be temporary and would fall off rapidly with distance.

Table 4.4-3. Air Quality Modeling Results for Airport Operations Associated with the Proposed Action and Alternatives ($\mu g/m^3$)

				Richards-Gebaur AFB									
						Proposed Action[a]		Aviation Alternative[a]		Aviation with Mixed Use Alternative[a]		Industrial Alternative[a]	
Pollutant	Averaging Time	Preclosure Background Concentration[b]	Limiting Standard[c]	Preclosure Conditions 1992	Closure Conditions 1994	1999	2004	1999	2004	1999	2004	1999	2004
Carbon	8-hour	2,760	10,000	212	199	173	253	104	132	126	163	227	224
Monoxide	1-hour	10,820	40,000	304	284	247	362	149	188	180	233	325	320
Sulfur	Annual	3	80	1.1	0.4	0.7	1.3	1.0	1.8	0.4	0.5	0.2	0.3
Dioxide	24-hour	12	365	4.6	1.4	2.7	5.1	4.1	7.0	1.5	1.9	1.0	1.0
	3-hour	76	1,300	10.3	3.1	6.1	11.5	9.2	15.8	3.3	4.3	2.1	2.3
PM_{10}	Annual	27	50	0.4	0.2	0.3	0.5	0.3	0.5	0.2	0.2	0.2	0.2
	24-hour	63	150	1.5	0.9	1.2	1.9	1.3	2.1	0.8	1.0	0.8	0.8

Notes: (a) Project pollutant concentrations determined from EDMS modeling results. Concentrations represent continued military aircraft operations and incremental increase of civilian airport operations.

(b) Background concentrations assumed to equal the mean of maximum concentrations measured during the period 1990-1992. (Refer to Table 3.4-4.)

(c) Limiting standard is equal to the NAAQS. Total impacts are determined by comparing the aggregate of reuse impact and background concentrations to the limiting standard.

EDMS = Emissions and Dispersion Modeling System.

$\mu g/m^3$ = micrograms per cubic meter.

NAAQS = National Ambient Air Quality Standards.

PM_{10} = particulate matter equal to or less than 10 microns in diameter.

Combustive emissions from construction equipment associated with the reuse alternatives were calculated based on the same average construction emission factors and assumptions as previously described for the Proposed Action. The total combustive emissions due to construction were estimated to be 1.1 tons per year of VOC, 4.2 tons per year of NO_x, 14.5 tons per year of CO, 0.4 ton per year of SO_x, and 0.3 ton per year of PM_{10} during the time period from 1994 to 1999. Emissions of VOC, NO_x, CO, SO_x, and PM_{10}, in the period from 1999 to 2004 would be 0.9 ton per year, 3.5 tons per year, 12.2 tons per year, 0.3 ton per year, and 0.3 ton per year, respectively.

Operation. A summary of construction and operation emissions for the Aviation Alternative is presented in Table 4.4-2. Aircraft operation emissions were calculated using the EDMS model. Estimates for all other categories of emissions were calculated using the per-capita forecasting methodology described in Appendix J.

Regional Scale. It is not expected that the Aviation Alternative would interfere with maintenance of the current attainment status for any pollutant. The regional scale impact of each pollutant is discussed below.

Ozone Precursors. Table 4.4-2 provides a comparison of emission estimates for Cass and Jackson counties (preclosure), Richards-Gebaur AFB (preclosure and closure), and the Aviation Alternative at 5- and 10-year increments after closure. Base-related emissions include the direct emissions at Richards-Gebaur AFB (see Section 3.4.3.2), as well as the indirect emissions associated with the base activities (see Appendix J). Similarly, the reuse-related emissions include both direct and indirect emissions associated with the Aviation Alternative. The reuse-related emissions of ozone precursors (VOC and NO_x) would be greater than emissions under both preclosure and closure conditions, but the increase would represent less than 0.5 percent of total NO_x and VOC emissions in Jackson and Cass counties. Therefore, the Aviation Alternative would not interfere with maintaining attainment of the ozone standard.

NO_2, CO, SO_2, and PM_{10}. Table 4.4-2 provides a means to compare emissions related to the Aviation Alternative to 1992 Cass and Jackson counties emissions and base preclosure and closure emission levels. All NO_x emissions in Table 4.4-2 are assumed to convert to NO_2 emissions on a regional basis. Emissions associated with reuse would be greater than emissions under either preclosure or closure conditions, but the increase would represent only a small fraction of the total ROI emissions. As discussed for the Proposed Action, the total emissions in the ROI are actually higher than indicated in Table 4.4-2. Therefore, as for the Proposed Action, because the increase in emissions under reuse would represent only a small percentage of total ROI emissions, and because the area is currently

in attainment of all standards, it is not expected that the Aviation Alternative would interfere with maintaining attainment of air quality standards.

Local Scale. A summary of the EDMS analysis for the Aviation Alternative is presented in Table 4.4-3. The modeling results show that during peak hours of airport operation, the maximum 1-hour pollutant concentrations would occur at receptors located at the northeast end of the crosswind runway (maximum CO impacts) and at the north end of the main runway (maximum impact of all pollutants other than CO). The primary contributing factor would be aircraft exhaust emitted during takeoffs. The modeling results indicate that concentrations would not exceed the NAAQS in the immediate area surrounding the airport. Emissions from airport activities under the Aviation Alternative would, therefore, have no adverse impact on the local air quality.

Mitigation Measures. As for the Proposed Action, there would be no impacts to regional or local air quality; therefore, no mitigation measures would be required. Measures could be implemented to reduce emissions from construction activities, as described for the Proposed Action.

Conformity with State/Local Plans. As discussed for the Proposed Action, if U.S. EPA promulgates conformity procedures in attainment areas, property recipients may be required to prepare a conformity determination on their actions.

4.4.3.3 Aviation with Mixed Use Alternative

Construction. Uncontrolled fugitive dust (particulate matter) emissions from ground-disturbing activities were estimated using the same methodology and assumptions as previously described for the Proposed Action. Construction activities would disturb an average of 11.0 acres per year from 1994 to 1999 and an average of 3.0 acres per year from 1999 to 2004. The amount of PM_{10} generated would be 1.2 tons per year from 1994 to 1999 and 0.3 ton per year from 1999 to 2004. These PM_{10} emissions would cause elevated short-term concentrations at receptors close to the construction areas. However, the elevated concentrations would be temporary and would fall off rapidly with distance.

Combustive emissions from construction equipment associated with the Aviation with Mixed Use Alternative were calculated based on the same average construction emission factors and assumptions as previously described for the Proposed Action. The total combustive emissions due to construction were determined to be 1.6 tons per year of VOC, 6.0 tons per year of NO_x, 21.0 tons per year of CO, 0.6 ton per year of SO_x, and 0.5 ton per year of PM_{10}, during the time period from 1994 to 1999. Emissions of VOC, NO_x, CO, SO_x, and PM_{10} in the period from 1999 to 2004 would be

0.4 ton per year, 1.6 tons per year, 5.7 tons per year, 0.2 ton per year, and 0.1 ton per year, respectively.

Operation. A summary of construction and operation emissions for the Aviation with Mixed Use Alternative is presented in Table 4.4-2. Aircraft operation emissions were calculated using the EDMS model. Estimates for all other categories of emissions were calculated using the per-capita forecasting methodology described in Appendix J.

Regional Scale. It is not expected that the Aviation with Mixed Use Alternative would interfere with maintenance of the current attainment status for any pollutant. The regional scale impact of each pollutant is discussed below.

Ozone Precursors. Table 4.4-2 provides a comparison of emission estimates for Cass and Jackson counties (preclosure), Richards-Gebaur AFB (preclosure and closure), and the Aviation with Mixed Use Alternative at 5- and 10-year increments after closure. Base-related emissions include the direct emissions at Richards-Gebaur AFB (see Section 3.4.3.2), as well as the indirect emissions associated with the base activities (see Appendix J). Similarly, the reuse-related emissions include both direct and indirect emissions associated with the Aviation with Mixed Use Alternative. The reuse-related emissions of ozone precursors (VOC and NO_x) would be greater than emissions that occur under either preclosure or closure conditions, but the increase would represent less than 0.5 percent of total ROI emissions. Therefore, the Aviation with Mixed Use Alternative would not interfere with maintaining attainment of the ozone standard.

NO_2, CO, SO_2, and PM_{10}. Table 4.4-2 provides a means to compare emissions related to the Aviation with Mixed Use Alternative to 1992 Cass and Jackson counties emissions and base preclosure and closure emission levels. All NO_x emissions in Table 4.4-2 are assumed to convert to NO_2 emissions on a regional basis. Emissions associated with reuse would be greater than emissions under either preclosure or closure conditions, but the increase would represent only a small fraction of the total ROI emission. As discussed for the Proposed Action the total emissions for Jackson and Cass counties are actually higher than shown in Table 4.4-2. Therefore, as for the Proposed Action, because the increase in emissions under reuse would represent only a small percentage of total ROI emissions, and because the area is currently in attainment of all standards, it is not expected that the Aviation with Mixed Use Alternative would interfere with maintaining attainment of air quality standards.

Local Scale. A summary of the EDMS analysis for the Aviation with Mixed Use Alternative is presented in Table 4.4-3. The modeling results show that during peak hours of airport operation, the maximum 1-hour pollutant concentrations would occur at receptors located at the northeast end of the

crosswind runway (maximum CO impacts) and at the north end of the main runway (maximum impact of all pollutants other than CO). The primary contributing factor would be aircraft exhaust emitted during takeoffs. The modeling results indicate that concentrations would not exceed the NAAQS in the immediate area surrounding the airport. Emissions from airport activities under the Aviation with Mixed Use Alternative would, therefore, have no adverse impact on the local air quality.

Mitigation Measures. As for the Proposed Action, there would be no impacts to regional or local air quality; therefore, no mitigation measures would be required. Measures could be implemented to reduce emissions from construction activities, as described for the Proposed Action.

Conformity with State/Local Plans. As discussed for the Proposed Action, if U.S. EPA promulgates conformity procedures in attainment areas, property recipients may be required to prepare a conformity determination on their actions.

4.4.3.4 Industrial Alternative

Construction. Uncontrolled fugitive dust (particulate matter) emissions from ground-disturbing activities are estimated using the same methodology and assumptions as previously described for the Proposed Action. Construction activities would disturb an average of 13.0 acres per year from 1994 to 1999 and an average of 4.0 acres per year from 1999 to 2004. The amount of PM_{10} generated would be 1.4 tons per year from 1994 to 1999 and 0.4 ton per year from 1999 to 2004. These PM_{10} emissions would cause elevated short-term concentrations at receptors close to the construction areas. However, the elevated concentrations would be temporary and would fall off rapidly with distance.

Combustive emissions from construction equipment associated with the Industrial Alternative were calculated as previously described for the Proposed Action. The total combustive emissions due to construction were determined to be 1.9 tons per year of VOC, 7.1 tons per year of NO_x, 24.8 tons per year of CO, 0.7 ton per year of SO_x, and 0.6 ton per year of PM_{10} during the time period from 1994 to 1999. Emissions of VOC, NO_x, CO, SO_x, and PM_{10} in the period from 1999 to 2004 would be 0.6 ton per year, 2.2 tons per year, 7.6 tons per year, 0.2 ton per year, and 0.2 ton per year, respectively.

Operation. A summary of construction and operation emissions for the Industrial Alternative is presented in Table 4.4-2. Aircraft operation emissions were calculated using the EDMS model. Estimates for all other categories of emissions were calculated using the per-capita forecasting methodology described in Appendix J.

Regional Scale. It is not expected that the Industrial Alternative would interfere with maintenance of the current attainment status for any pollutant. The regional scale impact of each pollutant is discussed below.

Ozone Precursors. Table 4.4-2 provides a comparison of emission estimates for Cass and Jackson counties (preclosure), Richards-Gebaur AFB (preclosure and closure), and the Industrial Alternative at 5- and 10-year increments after closure. Base-related emissions include the direct emissions at Richards-Gebaur AFB (see Section 3.4.3.2), as well as the indirect emissions associated with the base activities (see Appendix J). Similarly, the reuse-related emissions include both direct and indirect emissions associated with the Industrial Alternative. Reuse-related emissions of VOC in 1999 would be less than VOC emissions under preclosure conditions. The reuse-related emissions of ozone precursors (VOC and NO_x) would be greater than emissions at closure, but the increase would represent less than 0.5 percent of total ROI emissions. Therefore, the Industrial Alternative would not interfere with maintaining attainment of the ozone standard.

NO_2, CO, SO_2, and PM_{10}. Table 4.4-2 provides a means to compare emissions related to the Industrial Alternative to 1992 Cass and Jackson counties emissions and base preclosure and closure emission levels. All NO_x emissions in Table 4.4-2 are assumed to convert to NO_2 emissions on a regional basis. Emissions associated with reuse would be equal to or greater than emissions under preclosure and closure conditions, but the increase would represent only a small fraction of the total ROI emissions. As discussed for the Proposed Action, the total emissions for Jackson and Cass counties are actually higher than shown in Table 4.4-2. Therefore, as for the Proposed Action, because the increase in emissions under reuse would represent only a small percentage of total ROI emissions, and because the area is currently in attainment of all standards, it is not expected that the Industrial Alternative would interfere with maintaining attainment of air quality standards.

Local Scale. A summary of the EDMS analysis for the Industrial Alternative is presented in Table 4.4-3. The modeling results show that during peak hours of airport operation, the maximum 1-hour pollutant concentrations would occur at a receptor located at the north end of the main runway. The primary contributing factor would be aircraft exhaust emitted during takeoffs. The modeling results indicate that concentrations would not exceed the NAAQS in the immediate area surrounding the airport. Emissions from airport activities under the Industrial Alternative would, therefore, have no adverse impact on the local air quality.

Mitigation Measures. As for the Proposed Action, there would be no impacts to regional or local air quality; therefore, no mitigation measures

would be required. Measures could be implemented to reduce emissions from construction activities as described for the Proposed Action.

Conformity with State/Local Plans. As discussed for the Proposed Action, if U.S. EPA promulgates conformity procedures in attainment areas, property recipients may required to prepare a conformity determination on their actions.

4.4.3.5 No-Action Alternative. As described in Section 4.1, general aviation and military transient aircraft activities at Richards-Gebaur Airport would continue under the No-Action Alternative. There would be little or no construction activity. Therefore, air pollutant emissions from No-Action Alternative activities would be less than those for any of the reuse alternatives, and would have no adverse impact on regional or local air quality.

4.4.4 Noise

Environmental impact analysis related to noise includes the potential effects on the local human and animal populations. This analysis will estimate the extent and magnitude of noise levels generated by the Proposed Action and alternatives using the predictive models discussed below. The baseline noise conditions and predicted noise levels will then be assessed with respect to land use impacts. Potential annoyance, speech interference, and sleep interference will be discussed. The metric used to evaluate noise is DNL, supplemented occasionally by SEL and the A-weighted maximum sound level (L_{max}). These metrics are measured in units of A-weighted sound levels, dB. See Appendix I for an expanded discussion of these metrics.

Methods used to quantify the effects of noise such as annoyance, speech interference, sleep disturbance, health and hearing loss have undergone extensive scientific development during the past several decades. The most reliable measures at present are noise-induced hearing loss and annoyance. Extra-auditory effects (those not directly related to hearing capability) are also important, although they are not as well understood. The current scientific consensus is that "evidence from available research reports is suggestive, but it does not provide definitive answers to the question of health effects, other than to the auditory system, of long-term exposure to noise" (National Academy of Sciences, 1981). The effects of noise are summarized within this section and a detailed description is provided in Appendix I.

Annoyance. Noise annoyance is defined by the U.S. EPA as any negative subjective reaction to noise on the part of an individual or group.
Table 4.4-4 presents the results of over a dozen studies of transportation modes, including airports, investigating the relationship between noise and annoyance levels. This relationship has been suggested by the National

Table 4.4-4. Percentage of Population Highly Annoyed by Noise Exposure

DNL Interval in dB	Percentage of Persons Highly Annoyed
<65	<15
65-70	15-25
70-75	25-37
75-80	37-52

dB = decibel.
DNL = day-night average sound level.
Source: Adapted from National Academy of Sciences, 1977.

Academy of Sciences (1977) and recently re-evaluated (Fidell et al., 1989) for use in describing peoples' reactions to semi-continuous (transportation) noise. These data are shown to provide a perspective on the level of annoyance that might be anticipated. For example, 15 to 25 percent of persons exposed to DNL of 65 to 70 dB would be highly annoyed by the noise levels.

Speech Interference. One of the ways that noise affects daily life is by prevention or impairment of speech communication. In a noisy environment, understanding speech is diminished when speech signals are masked by intruding noises. Reduced intelligibility of speech may also have other effects; for example, if the understanding of speech is interrupted, performance may be reduced, annoyance may increase, and learning may be impaired. Research suggests that aircraft flyover noises that exceed approximately 60 dB (instantaneous sound level) interfere with speech communication (Bennett and Pearsons, 1981; Crook and Langdon, 1974). Increasing the level of the flyover noise maximum to 80 dB will reduce the intelligibility to zero, even if the person speaks in a loud voice. This interference lasts as long as the event, which is a moment for a flyover.

Sleep Interference. The effects of noise on sleep are of concern, primarily in assuring suitable residential environments. DNL incorporates consideration of sleep by assigning a 10 dB penalty to nighttime noise events. SEL may be used to supplement DNL in evaluating sleep disturbance. When evaluating sleep disturbance, studies have correlated SEL values with the percent of people awakened. The relationships between percent awakened and SEL are presented in Appendix I. Most of these relationships, however, do not reflect habituation and, therefore, would not address long-term sleep disturbance effects. SEL takes into account an event's sound intensity, frequency content, and time duration by measuring the total A-weighted sound energy of the event and incorporating it into a single number. Unlike DNL, which describes the daily average noise exposure, SEL describes the normalized noise from a single flyover, called an event.

Studies (Goldstein and Lukas, 1980; Lukas, 1975) show great variability in the percentage of people awakened by exposure to noise. A recent review (Pearsons et al., 1989) of the literature related to sleep disturbance, including field as well as laboratory studies, suggests that habituation may reduce the effect of noise on sleep. The authors point out that the relationship between noise exposure and sleep disturbance is complex and affected by the interaction of many variables. The large differences between the findings of the laboratory and field studies make it difficult to determine the best relationship to use. The method developed by Lukas would estimate seven times more awakening than the field results reported by Pearsons.

Land Use Compatibility. Estimates of total noise exposure resulting from aircraft operations, as expressed using DNL, can be interpreted in terms of the compatibility with designated land uses. The Federal Interagency Committee on Urban Noise developed land-use compatibility guidelines for noise (U.S. DOT, 1980). Based upon these guidelines, suggested compatibility guidelines for evaluating land uses in aircraft noise exposure areas were developed by the FAA and are presented in Section 3.4.4. The land use compatibility guidelines are based on annoyance and hearing loss considerations. Part 150 of the FAA regulations describes the procedures, standards, and methodology governing the development, submission and review of airport noise exposure maps and airport noise compatibility programs. It recommends use of yearly DNL in the evaluation of airport noise environments. It also identifies those land-use types that are normally compatible with various levels of exposure. Compatible or incompatible land use is determined by comparing the predicted DNL at a site with the proposed land uses.

Noise Modeling. In order to define the noise impacts from aircraft takeoff, landing, touch-and-go, and run-up operations at Richards-Gebaur AFB, the Air Force-developed, FAA-approved NOISEMAP version 6.1 was utilized to predict DNL 65, 70, and 75 dB noise contours and SEL values for noise-sensitive receptors. Appendix I defines these descriptors. The contours were generated for the Proposed Action and alternatives for three future year projections (5, 10, and 20 years after closure). These contours were overlaid on a U.S. Geological Survey (USGS) map of the base and vicinity. Input data to NOISEMAP version 6.1 include information on aircraft types; runway use; takeoff and landing flight tracks; aircraft altitude, speeds, and engine power settings; and number of daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) operations.

Surface vehicle traffic-noise levels for roadways in the vicinity of Richards-Gebaur AFB were analyzed using the FHWA's Highway Noise Model (FHWA, 1978). This model incorporates vehicle mix, traffic volume projections, day/night split, and speed to generate DNL.

Major Assumptions. Half of all aircraft operations were assumed to be takeoffs and half were landings. Operations are presented in Appendix I in detail. Flight tracks (incoming and outgoing), aircraft operations, and mix are included in Appendix I. All civilian operations were assumed to follow standard glide slopes and takeoff profiles provided by the FAA's Integrated Noise Model Database 3.10. Glide slopes and takeoff profiles for military aircraft are provided in the NOISEMAP model.

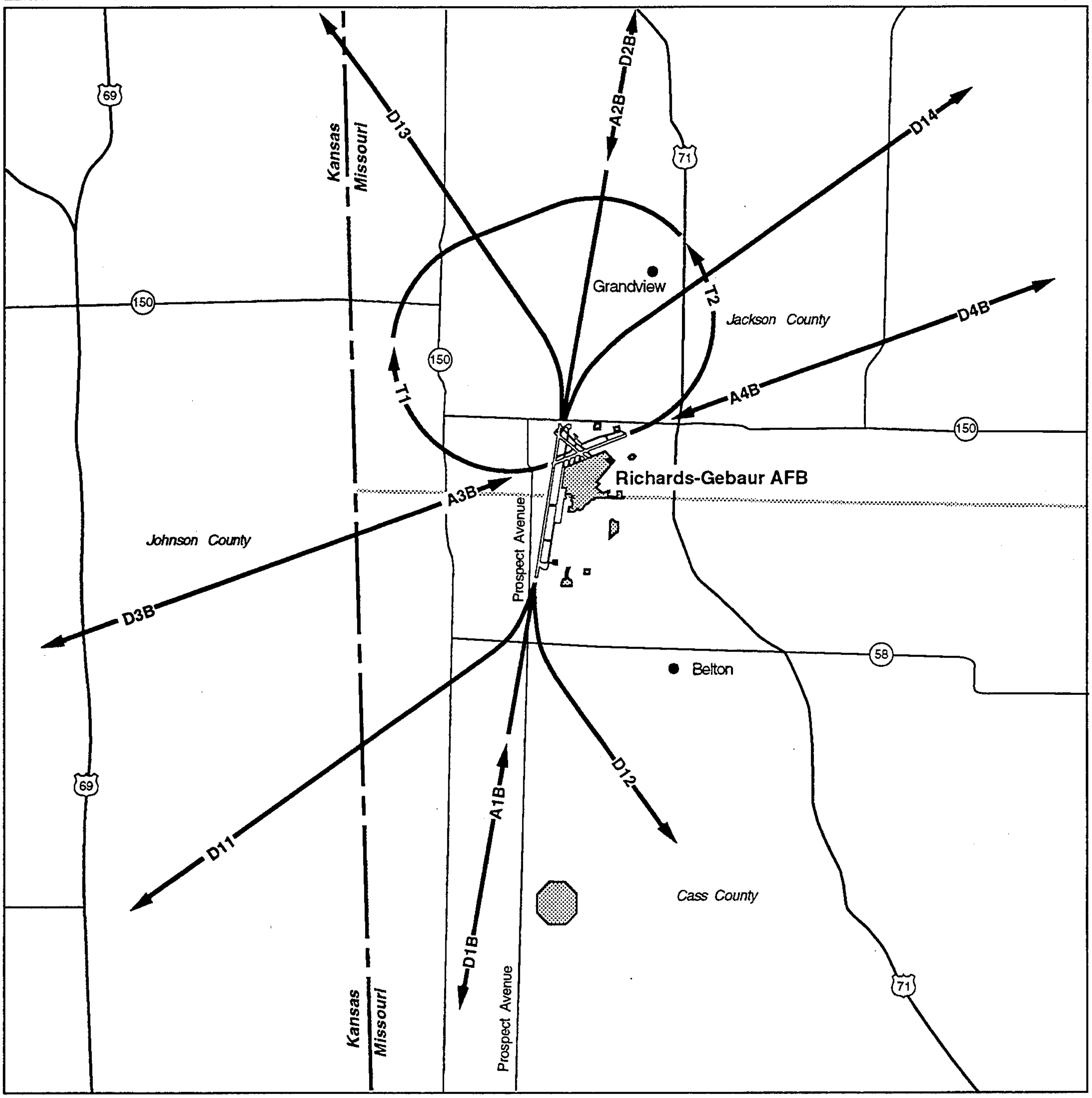
The criteria that define Stage 2 and Stage 3 aircraft are described in FAA Part 36 (FAA, 1988). Noise level limits are defined for takeoff, approach, and sideline measurements. No Stage 2 aircraft operations were modeled, reflecting the FAA's phase out of Stage 2 aircraft operations by 2000 (with limited exceptions).

Major roads leading to or around the base were analyzed. Traffic data used to project future noise levels were derived from information gathered in the traffic analysis presented in Section 4.2.3. Traffic data used in this analysis are presented in Appendix I.

4.4.4.1 Proposed Action. Civilian flight tracks in the vicinity of Richards-Gebaur AFB that were assumed for modeling for the Proposed Action are shown in Figure 4.4-1. Military flight tracks are presented in Appendix I.

Table 4.4-5 presents the approximate number of acres within each DNL range for each of the study years. Compared to the preclosure reference, this represents a decrease of 386 acres within DNL 65 dB in 1999, 288 acres in 2004, and 173 acres in 2014. The maximum exposure is projected for 2014 due to increasing operations. No residents would be exposed to DNL 65 dB or greater from aircraft operations. The results of the aircraft noise modeling for the Proposed Action for 2014 are presented as noise contours in Figure 4.4-2. The contribution from runup noise was included in the models at each end of the runway and on the east apron (see Appendix I for actual locations modeled).

SEL was calculated at representative residential locations (Figure 4.4-3) for the noisiest and most common jet aircraft. For all model years the noisiest civilian aircraft would be the B-727-200 retrofit, with the most common civilian jet aircraft being the Cessna Citation Turbojet. For military operations, the noisiest aircraft would be the F-18 fighter, although, as indicated in Table 2.2-4, there would only be a small number of F-18 operations annually. The most common military aircraft would be the A-10. The noisiest civilian aircraft were determined from the L_{max} as presented in FAA Advisory Circular AC 36-3F (FAA, 1990). The noisiest military aircraft were determined using NOISEMAP input data. The results of the SEL analyses are presented in Table 4.4-6. The analysis suggests that, for the Proposed Action, some aircraft overflights could affect the sleep of some residents in the area.



EXPLANATION

D3B Flight Paths for Richards-Gebaur Airport

71 U.S. Highway

58 State Highway

County Line

State Boundary

0 1/2 1 2 Miles

Civilian Flight Tracks

Figure 4.4-1

Table 4.4-5. DNL Exposure for the Alternative Reuse Plans (acres)

		DNL in dB			
Year	Alternative	65-70	70-75	>75	Total ≥ 65dB
1992	Preclosure	363	156	160	679
1994	Closure	147	113	11	271
1999	Proposed Action	153	125	15	293
	Aviation Alternative	145	116	13	274
	Aviation with Mixed Use Alternative	106	11	0	117
	Industrial Alternative	114	104	10	228
2004	Proposed Action	211	136	44	391
	Aviation Alternative	196	130	54	380
	Aviation with Mixed Use Alternative	127	14	0	141
	Industrial Alternative	114	107	11	232
2014	Proposed Action	273	132	101	506
	Aviation Alternative	243	125	91	459
	Aviation with Mixed Use Alternative	146	18	1	165
	Industrial Alternative	120	114	13	247

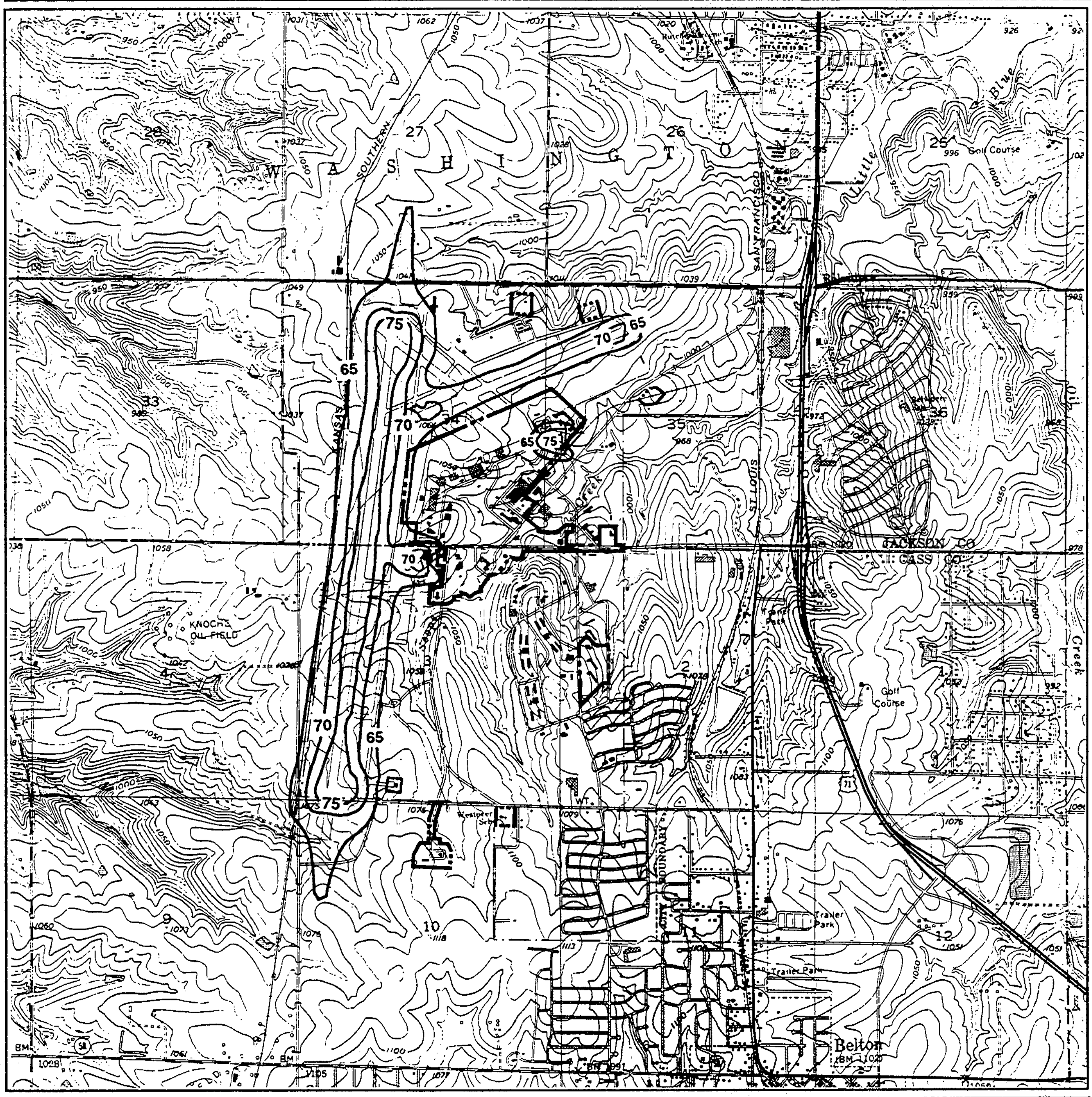
dB = decibel.
DNL = day-night average sound level.

Surface traffic sound levels for several road segments are presented in Appendix I. In 2014, there would be 315 people residing in areas exposed to DNL 65 dB and above due to surface traffic, the same as under the No-Action Alternative.

Mitigation Measures. No people would reside in areas exposed to DNL 65 dB or greater from aircraft operations, and there would be no increase in the number of residents exposed to DNL 65 dB or above due to reuse-related surface traffic; therefore, no noise mitigations would be required.

4.4.4.2 Aviation Alternative. Civilian flight tracks in the vicinity of Richards-Gebaur AFB that were assumed for modeling for the Aviation Alternative are shown in Figure 4.4-1. Military flight tracks are presented in Appendix I.

Table 4.4-5 presents the approximate number of acres within each DNL range for each of the study years. Compared to the preclosure reference, this represents a decrease of 405 acres within DNL 65 dB in 1999, 299 acres in 2004, and 220 acres in 2014. The maximum exposure is projected for 2014 due to increasing operations. No residents would be exposed to DNL 65 dB or greater from aircraft operations. The results of the aircraft noise modeling for the Aviation Alternative for 2014 are presented as noise contours in Figure 4.4-4. The contribution from runup



EXPLANATION

— 65 — DNL Noise Contour (in 5 dB intervals)

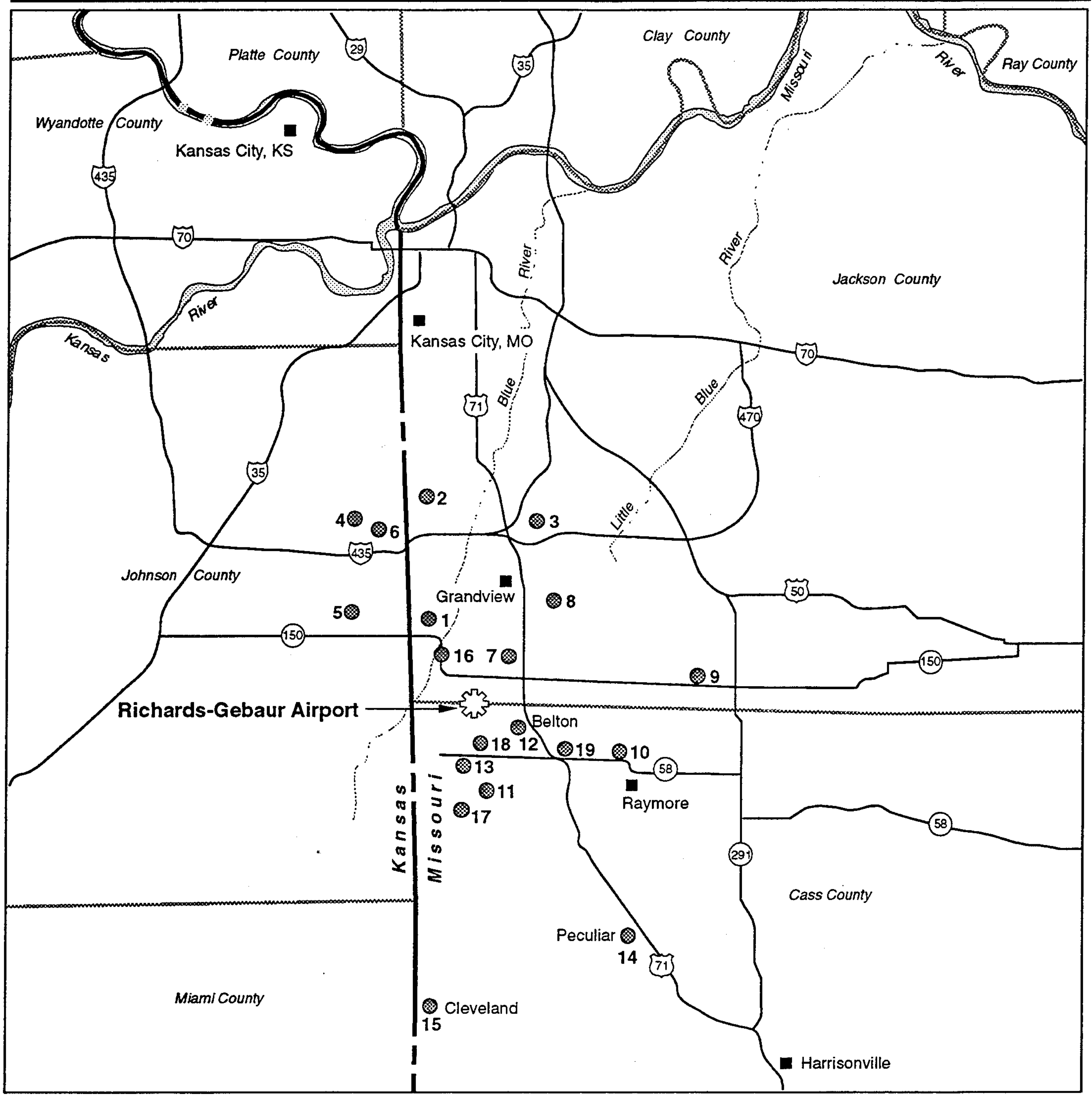
- - - - Base Boundary

DNL Noise Contours - Proposed Action (2014)

0 750 1500 3000 Feet

Map Source: U.S. Geological Survey, 1975.

Figure 4.4-2



EXPLANATION

- SEL Location
- Interstate Highway
- U.S. Highway
- State Highway
- County Boundary
- State Boundary

0 1.5 3 6 Miles

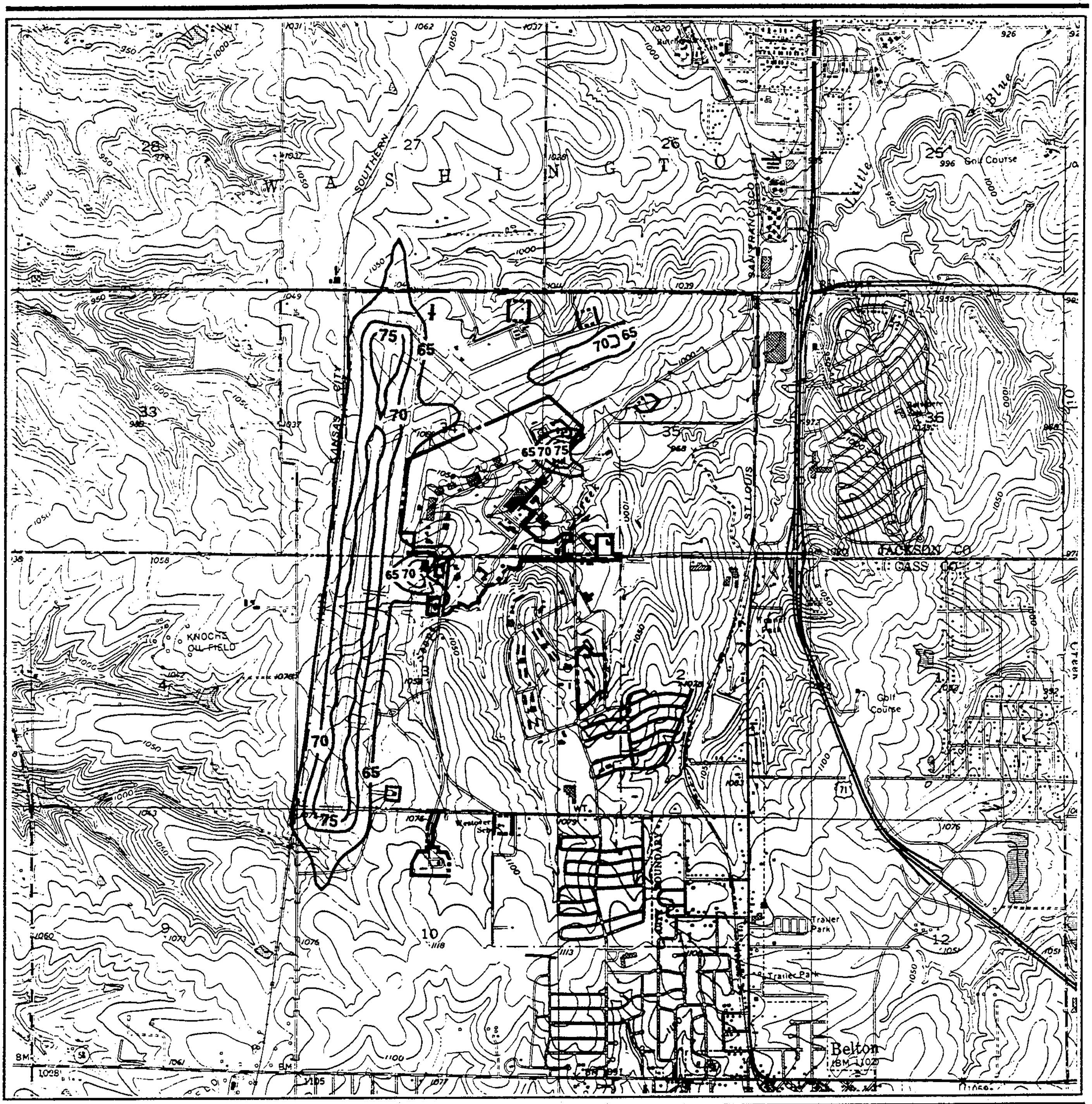
Sound Exposure Level (SEL) Receptor Locations

Figure 4.4-3

Table 4.4-6. Sound Exposure Levels at Representative Noise Receptors

			Sound Exposure Level (dB) Aircraft Type				
No.[a]	Community	Receptor Location	727-200	Citation I	F-18	C-9	A-10
1	Kansas City	Residential area near intersection of Blue Ridge Boulevard and Locust	88	75	99	90	94
2	Kansas City	Residential area near intersection of Wornall Road and 91 Terrace	75	59	75	70	60
3	Raytown	Residential area near intersection of Belmont and Bannister Road	84	69	89	75	71
4	Prairie Village	Residential area near intersection of 95th Street and Delmar Drive	87	71	78	65	57
5	Overland Park	Residential area near intersection of Roe Avenue and 122nd Street	73	58	92	79	77
6	Leawood	Residential area near intersection of Lee Boulevard and 96th Street	84	69	73	68	58
7	Grandview	Residential area near intersection of Southern Road and 141st Street	91	77	94	90	79
8	Grandview	Residential area near intersection of Highgrove Road and Sycamore	90	76	90	88	74
9	Lee's Summit	Residential area near intersection of M-150 and Pryor Road	60	43	77	68	61
10	Raymore	Residential area near intersection of 170th Street and Kentucky	69	53	91	91	75
11	Belton	Residential area near intersection of Cambridge and Ridge Road	93	80	96	97	81
12	Belton	Trailer park near North Scott and Oil Lane	76	62	89	80	73
13	Belton	Residential area near intersection of South Benton and 171st Street	103	86	105	104	94
14	Peculiar	Residential area near intersection of Main Street and North Street	83	67	66	55	51
15	Cleveland	Residential area near intersection of Highway Y and Route D	84	67	91	77	75
16	Rural Cass County	Residential area along Route D South of Jackson County Line	81	66	101	89	91
17	Rural Cass County	Residential area along Route D (Jaudon)	89	74	101	88	89
18	Belton	Residential area near intersection of Sunset Lane and Kenneth Lane	94	79	102	94	87
19	Belton	Medical Center near intersection of M-58 and US 71	71	56	92	93	76

Note: (a) Numbers correspond to numbered locations on Figure 4.4-3.
dB = decibel.
M = Missouri Highway.
US = United States Highway.



EXPLANATION

— 65 — DNL Noise Contour (in 5 dB intervals)

- - - - Base Boundary

DNL Noise Contours - Aviation Alternative (2014)

0 750 1500 3000 Feet

Map Source: U.S. Geological Survey, 1975.

Figure 4.4-4

noise was included in the models at each end of the runway and on the east apron (see Appendix I for actual locations modeled).

SEL was calculated at representative residential locations (see Figure 4.4-3) for the noisiest and most common jet aircraft. For all model years the noisiest civilian aircraft would be the B-727-200 retrofit, with the most common civilian jet aircraft being the Cessna Citation Turbojet. For military operations, the noisiest aircraft would be the F-18 fighter, although, as indicated in Table 2.3-4, there would only be a small number of F-18 operations annually. The most common military aircraft would be the A-10. The noisiest civilian aircraft were determined from the L_{max} as presented in FAA Advisory Circular AC 36-3F (FAA, 1990). The noisiest military aircraft were determined using NOISEMAP input data. The results of the SEL analyses are presented in Table 4.4-6. The analysis suggests that, for the Aviation Alternative, some aircraft overflights could affect the sleep of some residents in the area.

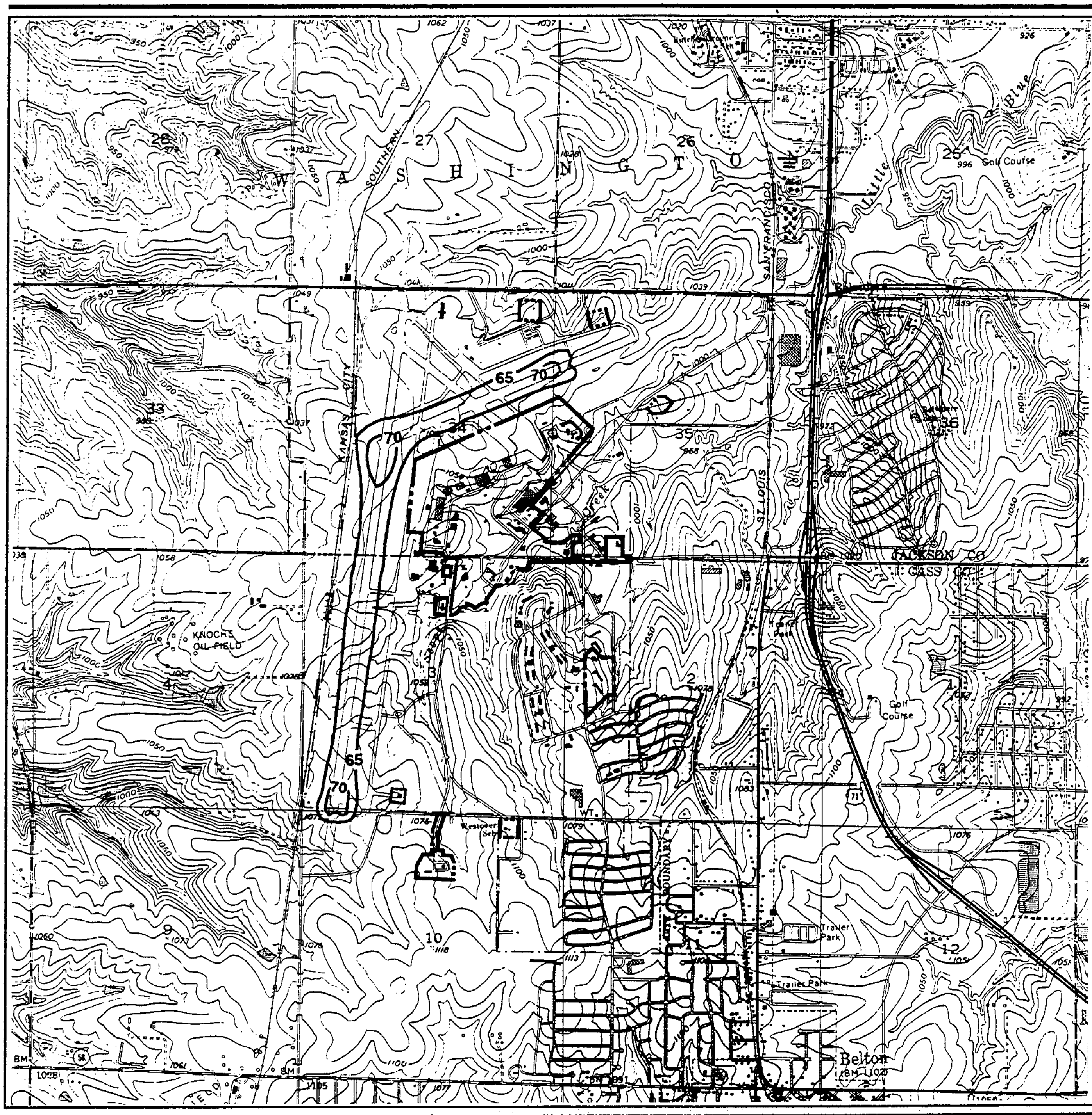
Surface traffic sound levels for several road segments are presented in Appendix I. In 2014, there would be 315 people residing in areas exposed to DNL 65 dB and above due to surface traffic, the same as under the No-Action Alternative.

Mitigation Measures. No people would reside in areas exposed to DNL 65 dB or greater from aircraft operations, and there would be no increase in the number of people exposed to DNL 65 dB or above due to reuse-related surface traffic; therefore, no noise mitigations would be required.

4.4.4.3 Aviation with Mixed Use Alternative. Civilian flight tracks modeled for the Aviation with Mixed Use Alternative are shown in Figure 4.4-1. Military flight tracks are presented in Appendix I.

Table 4.4-5 presents the approximate number of acres within each DNL range in 1999, 2004, and 2014. Compared to the preclosure reference, this represents a decrease of 562 acres within DNL 65 dB in 1999, 538 acres in 2004, and 514 acres in 2014. The maximum exposure is projected for 2014. No residents would be exposed to DNL 65 dB or greater from aircraft operations. The results of the aircraft noise modeling for the Aviation with Mixed Use Alternative are presented as noise contours in Figure 4.4-5.

SEL was calculated at representative residential locations (see Figure 4.4-3) for the noisiest and most common jet aircraft. For all model years the noisiest and most common civilian aircraft would be the Cessna Citation Turbojet. For military operations, the noisiest aircraft would be the C-9 transport and the most common aircraft would be the A-10. The results of the SEL analysis are presented in Table 4.4-6. The analysis suggests that, for this alternative, some aircraft overflights could affect the sleep of some residents in the area.



EXPLANATION

— 65 — DNL Noise Contour (in 5 dB intervals)

- - - - Base Boundary

DNL Noise Contours - Aviation with Mixed Use Alternative (2014)

0 750 1500 3000 Feet

Map Source: U.S. Geological Survey, 1975.

Figure 4.4-5

Surface traffic sound levels for several road segments are presented in Appendix I. In 2014, there would be 315 people residing in areas exposed to DNL 65 dB or higher due to surface traffic, the same as under the No-Action Alternative.

Mitigation Measures. No people would reside in areas exposed to DNL 65 dB or greater from aircraft operations, and there would be no increase in the number of people exposed to DNL 65 dB or above due to reuse-related surface traffic; therefore, no noise mitigations would be required.

4.4.4.4 Industrial Alternative. Civilian flight tracks for the main runway only were modeled for the Industrial Alternative (see Figure 4.4-1). Military flight tracks are presented in Appendix I.

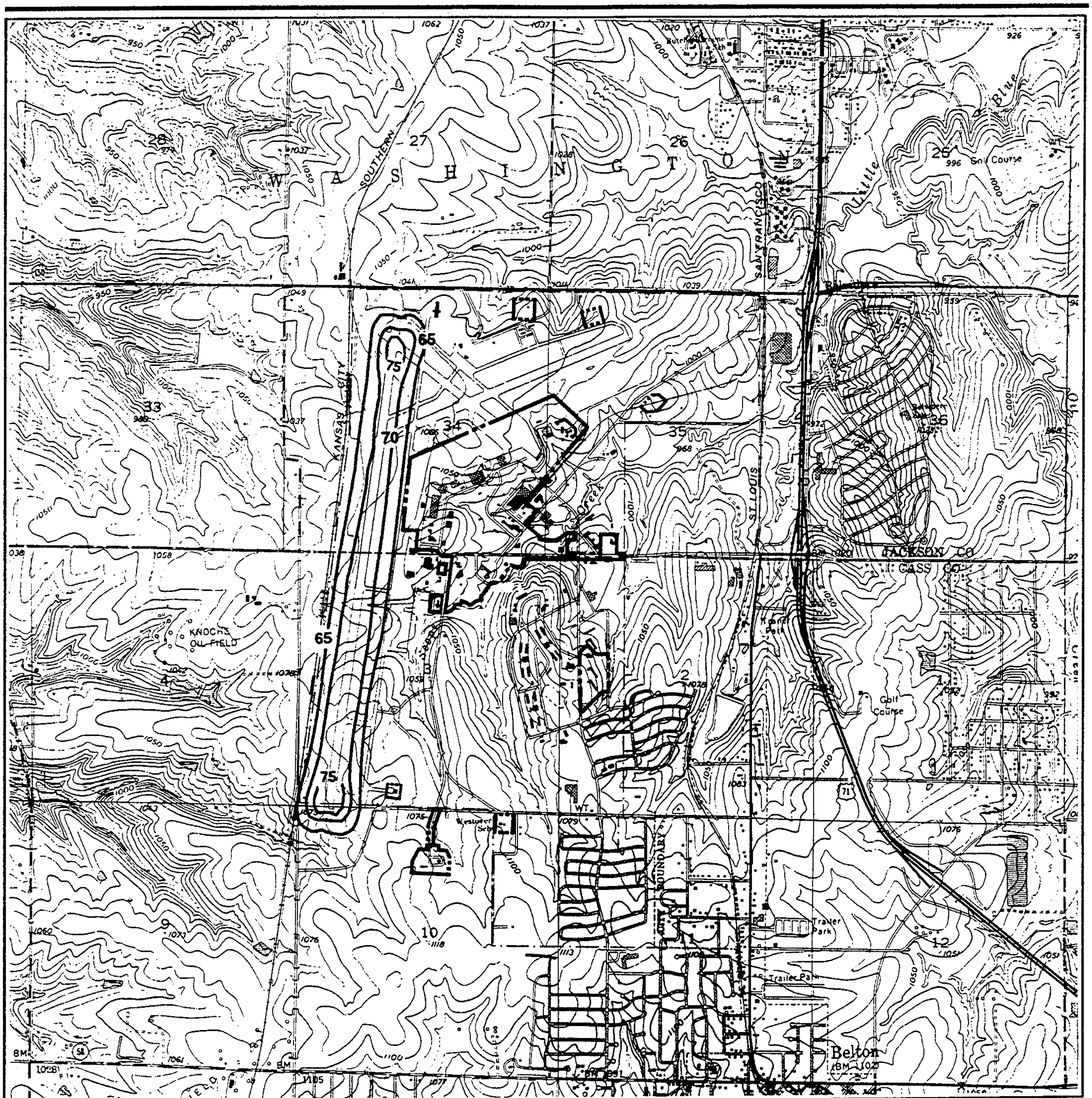
Table 4.4-5 presents the approximate number of acres within each DNL range for each of the study years. Compared to the preclosure reference, this represents a decrease of 451 acres within DNL 65 dB in 1999, 447 acres in 2004, and 432 acres in 2014. The maximum exposure is projected for 2014. No residents would be exposed to DNL 65 or greater from aircraft operations. The results of the aircraft noise modeling for the Industrial Alternative for 2014 are presented as noise contours in Figure 4.4-6.

SEL was calculated at representative residential locations (see Figure 4.4-3) for the noisiest and most common jet aircraft. For all model years the noisiest and most common civilian aircraft would be the Cessna Citation Turbojet. For military operations, the noisiest aircraft would be the F-18 fighter, although, as indicated in Table 2.3-14, there would be only a small number of F-18 operations annually. The most common military aircraft would be the A-10. The results of the SEL analysis are presented in Table 4.4-6. The analysis suggests that, for this alternative, some aircraft overflights could affect the sleep of some residents in the area.

Surface traffic sound levels for several road segments are presented in Appendix I. In 2014, there would be 315 people residing in areas exposed to DNL 65 dB and above due to surface traffic, the same as under the No-Action Alternative.

Mitigation Measures. No people would reside in areas exposed to DNL 65 dB or greater from aircraft operations, and there would be no increase in the number of people exposed to DNL 65 dB or above due to reuse-related surface traffic; therefore, no noise mitigations would be required.

4.4.4.5 No-Action Alternative. As described in Section 4.1, general aviation and military transient aircraft activity would continue under the No-Action Alternative. Only the main runway would be used, and noise levels from aircraft activity would be similar to those projected for the Industrial Alternative.



EXPLANATION

— 65 — DNL Noise Contour (in 5 dB intervals)

- - - - Base Boundary

DNL Noise Contours - Industrial Alternative (2014)

0 750 1500 3000 Feet

Map Source: U.S. Geological Survey, 1975.

Figure 4.4-6

Surface traffic sound levels are presented in Appendix I. These levels are presented in terms of DNL as a function of the centerline of the roadways analyzed. At closure, approximately 189 people would reside within areas exposed to DNL 65 dB and above. This number would increase to 315 by 2014.

4.4.5 Biological Resources

The Proposed Action and alternatives could potentially affect biological resources through alteration or loss of vegetation and wildlife habitat. Assumptions used in analyzing the effects of the alternatives include:

- All staging and other areas disturbed temporarily by construction would be placed in previously disturbed areas (e.g., paved or cleared areas), to the fullest extent possible.

- Proportions of disturbance associated with each land use category were determined based on acceptable land use planning concepts. Development within each parcel could occur at one or more locations anywhere within that category, unless designated as vacant land on the project maps.

4.4.5.1 Proposed Action. Development under the Proposed Action would have minimal impacts on biological resources, and those would primarily be associated with loss of vegetation and wildlife habitat, including small amounts of wetland areas.

Vegetation. Ground-disturbing activities would take place over 20 years and would occur mostly in developed (paved) and landscaped areas. Landscaped areas on the base contain native and nonnative species that have little biological value; therefore, impacts from construction activities would be minimal.

Wildlife. Effects on wildlife would be related to habitat loss, aircraft/animal collisions, and noise. Loss or alteration of habitat would affect wildlife species by displacement of mobile species to adjacent areas and by the possible mortality of less mobile species. The displaced animals would compete with the residents for available resources, causing minor ecological perturbation until the populations re-establish equilibrium. Wetland and wooded habitats have a relatively high biological value, but are limited in size and represent a very small portion of similar type of habitat in the region. Therefore, impacts to wildlife from the construction of facilities are expected to be negligible.

No new development is proposed at the Belton Training Complex and the use would be the same as prior to closure. Therefore, no impacts are expected.

The Proposed Action would generate more flights than preclosure and closure conditions, which could increase the potential for bird-aircraft hazards and noise impacts. However, it is anticipated that the increase in aircraft operations would result in only a few more bird-aircraft collisions annually. The local species are also familiar with aircraft noise and can be assumed to be tolerant of noise disturbance. Further, a smaller area would be exposed to high noise levels than under preclosure conditions because of the transition to quieter aircraft. Noise from construction and ground operations activities may cause short-term, minor stress on wildlife species.

Threatened and Endangered Species. The Air Force has conducted informal consultation with the USFWS under Section 7 of the Endangered Species Act (16 U.S.C. §§1531 et seq.) to identify potential impacts occurring from land conveyance to private parties. There are no federal- or state-listed threatened or endangered species known to occur on Richards-Gebaur AFB. Therefore, no impacts to listed species would occur from the disposal and reuse of the base.

Sensitive Habitats. Wetlands are the only sensitive habitat that occur on Richards-Gebaur AFB, and are present along natural drainages. Construction activities and operations could fill or otherwise directly impact these wetlands and the plant and animal species they support. Planned development under the Proposed Action could affect 0.6 acre of wetlands in the Cantonment Area. Because the wetlands are situated along drainages where the topography is unsuitable for facility development, direct impacts to wetlands are unlikely. Facilities sited near wetlands could indirectly affect the quality of wetland habitat through erosion and chemical runoff.

No new development is proposed at the Belton Training Complex and the use would remain the same as before closure. Therefore, no wetland impacts are expected.

Mitigation Measures. Wetlands on base would be protected in compliance with Executive Order 11990 and Section 404 of the Clean Water Act (33 U.S.C. §§1251 et seq.). Mitigations should focus on avoidance of direct and indirect disturbance of wetlands through facility design or appropriate restrictions in the transfer documents. Avoidance of disturbance could include controlling runoff from construction sites into drainages through use of berms, silt curtains, straw bales, and other appropriate techniques. Equipment could be washed in areas where wash water could be contained and treated or evaporated.

4.4.5.2 Aviation Alternative. Impacts to biological resources under the Aviation Alternative would be minimal, similar to those described for the Proposed Action.

Vegetation. Effects on vegetation would be similar to those discussed for the Proposed Action. Disturbance to grasslands and wooded areas in the Belton Training Complex during construction of houses and a new access road would have minimal impacts because of the limited size of the undisturbed areas there and the extent of similar grasslands and wooded areas surrounding it.

Wildlife. Effects on wildlife would be related to habitat loss, aircraft/animal collisions, and noise. Construction-related effects would be similar to those discussed for the Proposed Action, and impacts to wildlife are expected to be negligible. Construction of the residential facilities and new access route at the Belton Training Complex would remove habitat and could result in a decrease in local populations of prairie species and an increase in common species such as the European starling, English house sparrow, and domestic dogs and cats. The increased human presence could cause stress to remaining wildlife species and may cause them to relocate from the area.

The Aviation Alternative would generate more flights than preclosure and closure conditions, and the potential for bird-aircraft hazards and noise impacts would be similar to that discussed for the Proposed Action.

Threatened and Endangered Species. Because there are no federally or state-listed threatened or endangered species known to occur on Richards-Gebaur AFB, no impacts to listed species would occur from the disposal and reuse of the base.

Sensitive Habitats. Planned development under the Aviation Alternative could affect 0.6 acre of wetlands in the Cantonment Area and an additional 0.2 acre of wetlands at the Belton Training Complex. Because the wetlands are situated along drainages where the topography is unsuitable for facility development, direct impacts to wetlands are unlikely. Facilities sited near wetlands could indirectly affect the quality of wetland habitat through erosion and chemical runoff.

Mitigation Measures. Wetlands on base would be protected in compliance with Executive Order 11990 and Section 404 of the Clean Water Act. The same mitigation measures as described for the Proposed Action would be appropriate.

4.4.5.3 Aviation with Mixed Use Alternative. Effects to biological resources as a result of the Aviation with Mixed Use Alternative would be minimal and similar to those described for the Proposed Action.

Vegetation. Effects on vegetation would be similar to those discussed for the Proposed Action. Disturbance to grasslands and wooded areas in the Belton Training Complex during development of a new access road and park facilities would have minimal impacts because of the limited size of the

undisturbed areas there and the extent of similar grasslands and wooded areas surrounding it.

Wildlife. Effects on wildlife would be related to habitat loss, aircraft/animal collisions, and noise. Construction-related effects would be similar to those discussed for the Proposed Action, and impacts to wildlife are expected to be negligible.

Development of a regional park and a new access route at the Belton Training Complex would remove habitat and could result in a decrease in local populations of prairie species and an increase in common species such as the European starling, English house sparrow, and domestic dogs and cats. The increased human presence could cause stress to remaining wildlife species and may cause them to relocate from the area. However, these effects would be less than under the Aviation Alternative.

The Aviation with Mixed Use Alternative would generate more flights than preclosure and closure conditions, and the potential for bird-aircraft hazards and noise impacts would be similar to that discussed for the Proposed Action.

Threatened and Endangered Species. Because there are no federally or state-listed threatened or endangered species known to occur on Richards-Gebaur AFB, no impacts to listed species would occur from the disposal and reuse of the base.

Sensitive Habitats. Planned development under the Aviation with Mixed Use Alternative could affect 0.6 acre of wetlands in the Cantonment Area and 0.2 acre of wetlands at the Belton Training Complex. Because the wetlands are situated along drainages where the topography is unsuitable for facility development, direct impacts to wetlands are unlikely. Facilities sited near wetlands could indirectly affect the quality of wetland habitat through erosion and chemical runoff.

Mitigation Measures. Wetlands on base would be protected in compliance with Executive Order 11990 and Section 404 of the Clean Water Act. The same mitigation measures as described for the Proposed Action would be appropriate.

4.4.5.4 Industrial Alternative. Effects to biological resources under the Industrial Alternative would be minimal and similar to those under the Proposed Action.

Vegetation. Effects on vegetation would be similar to those described for the Proposed Action. Disturbance to grasslands and wooded areas resulting from agricultural activities in the Belton Training Complex would have

minimal impacts because of the limited size of the undisturbed areas there and the extent of similar grasslands and wooded areas surrounding it.

Wildlife. Effects on wildlife would be related to habitat loss, aircraft/animal collisions, and noise. Construction-related effects would be similar to those discussed for the Proposed Action, and impacts to wildlife are expected to be negligible.

Agricultural activities at the Belton Training Complex would remove habitat and could result in a decrease in local populations of prairie species and an increase in common species such as the European starling, English house sparrow, and domestic dogs and cats. There would, however, be little disturbance from human presence in the area, and effects are expected to be smaller than under the other two reuse alternatives.

The Industrial Alternative would generate more flights than preclosure and closure conditions, which could increase the potential for bird-aircraft hazards and noise impacts; but this alternative would result in fewer flights, and therefore fewer impacts than the other alternatives. Noise from construction and ground operations activities may cause short-term, minor stress on wildlife species.

Threatened and Endangered Species. Because there are no federally or state-listed threatened or endangered species known to occur on Richards-Gebaur AFB, no impacts to listed species would occur from the disposal and reuse of the base.

Sensitive Habitats. Planned development under the Industrial Alternative could affect 0.6 acre of wetlands in the Cantonment Area and 0.2 acre of wetlands at the Belton Training Complex. Because the wetlands are situated along drainages where the topography is unsuitable for facility development, direct impacts to wetlands are unlikely. Facilities sited near wetlands could indirectly affect the quality of wetland habitat through erosion and chemical runoff.

Mitigation Measures. Wetlands on base would be protected in compliance with Executive Order 11990 and Section 404 of the Clean Water Act. The same mitigation measures as described for the Proposed Action would be appropriate.

4.4.5.5 No-Action Alternative. Maintenance of the base would have the fewest adverse effects on biological resources. A reduction in human activity would reduce disturbance and alteration of habitat for wildlife on and in the vicinity of the base. Habitat quality would improve if mowing of non-landscaped areas were terminated. This would allow wildlife populations to increase, and would have an overall positive effect on biological resources on Richards-Gebaur AFB.

4.4.6 Cultural Resources

Potential impacts to cultural resources were assessed by (1) identifying types and possible locations of reuse activities that could directly or indirectly affect cultural resources, and (2) identifying the nature and potential significance of cultural resources in potentially affected areas. Pursuant to the NHPA, as directed by the Section 106 review process, consultation has been initiated with the Missouri SHPO.

Historic properties, under 36 CFR 800, are defined as any prehistoric, historic, or traditional district, site, building, structure, or object included in, or eligible for inclusion in, the National Register. For the purposes of these regulations, the term also includes artifacts, records, and remains that are related to, and located within, such properties. The term "eligible for inclusion in the National Register" includes both properties formally determined as such by the Secretary of the Interior and all other properties that meet National Register listing criteria. Therefore, sites that meet the criteria, but are not yet evaluated, are considered potentially eligible to the National Register and, as such, are afforded the same regulatory consideration as nominated historic properties.

As a federal agency, the Air Force is responsible for identifying any historic properties at Richards-Gebaur AFB. This identification process may include not only archival research, field surveys and the recording of cultural resources, but also evaluations to develop determinations of significance in terms of National Register criteria. Criteria and related qualities of significance are discussed in Appendix E. Completion of this process results in a listing of historic properties subject to federal regulations regarding the treatment of cultural resources.

No prehistoric or historic archaeological, traditional, or paleontological sites have been identified that would be adversely affected by disposal and reuse activities under the Proposed Action or any of the reuse alternatives analyzed. Furthermore, no concerns about these activities have been expressed by any traditional group. The Missouri SHPO has been consulted regarding the status of archaeological resources at Richards-Gebaur AFB and has determined that disposal and reuse would have no effect (Appendix K).

Regulations for implementing Section 106 of the NHPA stipulate that the conveyance of a historic property without adequate measures to ensure preservation is considered to be an adverse impact, thereby ensuring full regulatory consideration in federal project planning and execution. As a result, Building 602, which has been determined by the Missouri SHPO to be potentially eligible to the National Register (Appendix K), could be impacted by conveyance.

4.4.6.1 Proposed Action. Under the Proposed Action, Building 602 would be within a land use area proposed for office/industrial space. The conceptual nature of these activities precludes identifying specific impacts to Building 602. The proposed land use, however, does have the potential to affect the integrity and setting of this potential historic property through building modification and adjacent construction.

Mitigation Measures. Adherence to the following general procedures could reduce or eliminate the impacts associated with the Proposed Action to a non-adverse level. Properties may be conveyed to non-federal owners with preservation covenants to ensure that future owners will abide by cultural resources management procedures dictated by the NHPA, or their equivalent, as approved by the SHPO and the Advisory Council on Historic Preservation. Impacts due to conveyance can thus be reduced to a non-adverse level.

In accordance with Section 106 of the NHPA and its implementing regulations, the agency or reuse proponent, as appropriate, would consult with the SHPO and the Advisory Council on Historic Preservation during the development and implementation of specific procedures and mitigation strategies. Mitigation proposed would comply with the appropriate standards and guidelines established for historic preservation activities by the Secretary of the Interior and other federal, state, and local regulations, as applicable.

An agreement document may be prepared to establish acceptable mitigation measures. A Memorandum of Agreement or Programmatic Agreement must be coordinated with, at a minimum, the SHPO, the Advisory Council on Historic Preservation, and the Air Force; other parties would be included as appropriate.

4.4.6.2 Aviation Alternative. Under the Aviation Alternative, Building 602 would be within a proposed industrial land use area intended for manufacturing, warehouses, and distribution centers. The conceptual nature of these activities precludes identifying specific impacts to Building 602; however, the proposed land use does have the potential to affect the integrity and setting of this potential historic property through building modification and adjacent construction.

Mitigation Measures. The same mitigation measures discussed for the Proposed Action would be appropriate.

4.4.6.3 Aviation with Mixed Use Alternative. As discussed under the Proposed Action, only potential for impacts to cultural resources would be from reuse of Building 602, which the Missouri SHPO has determined to be potentially eligible for listing on the National Register. Under the Aviation with Mixed Use Alternative, Building 602 would be within a proposed public

facilities/recreation land use area, and would be used for public agency offices. The conceptual nature of these activities precludes identifying specific impacts to Building 602. The proposed land use, however, does have the potential to affect the integrity and setting of this potential historic property through building modification and adjacent construction.

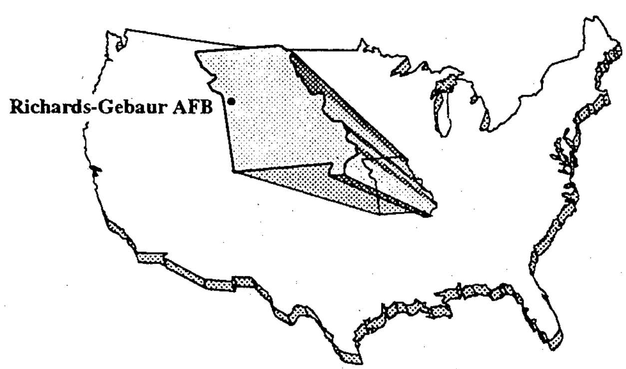
Mitigation Measures. The same mitigation measures discussed for the Proposed Action would be appropriate.

4.4.6.4 Industrial Alternative. As discussed under the Proposed Action the only potential for impacts to cultural resources would be from reuse of Building 602, which the Missouri SHPO has determined to be potentially eligible for listing on the National Register.

Under the Industrial Alternative, Building 602 would be within a proposed institutional (medical) land use area, and would be used for medical offices. The conceptual nature of these activities precludes identifying specific impacts to Building 602. The proposed land use, however, does have the potential to affect the integrity and setting of this potential historic property through building modification and adjacent construction.

Mitigation Measures. The same mitigation measures discussed for the Proposed Action would be appropriate.

4.4.6.5 No-Action Alternative. There would be no effect on cultural resources resulting from implementation of the No-Action Alternative because Richards-Gebaur AFB property would remain under caretaker status. However, the OL should continue to maintain Building 602 to preserve its structural integrity and prevent deterioration.



CHAPTER 5
CONSULTATION AND COORDINATION

5.0 CONSULTATION AND COORDINATION

The federal, state, and local agencies and private agencies/organizations that were contacted during the course of preparing this EIS are listed below.

FEDERAL AGENCIES

Federal Aviation Administration
United States Department of Agriculture, Soil Conservation Service
United States Environmental Protection Agency, Region VII
United States Fish and Wildlife Service

STATE AGENCIES

Missouri Department of Conservation
Missouri Department of Natural Resources
Missouri Department of Solid Waste Management
Missouri State Historic Preservation Office

LOCAL/REGIONAL AGENCIES

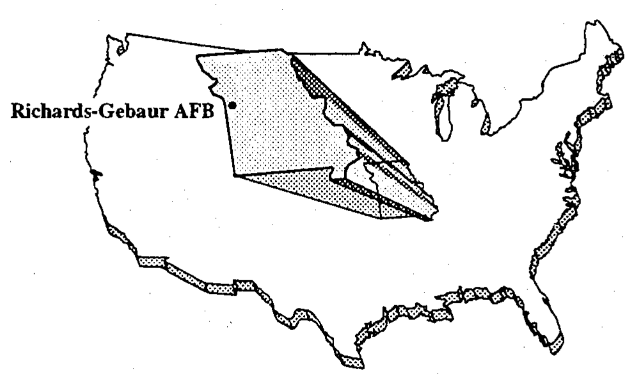
Cass County
Cass County Assessor's Office
Cass County Water Supply District No. 2
Cass County Sheriff's Department
City of Belton
City of Grandview
Grandview Community Development
Grandview Development Department
Jackson County
Jackson County Assessor's Office
Jackson County Department of Soil and Water Conservation
Jackson County Public Water Supply District #1
Johnson County Airport Commission
Kansas City Aviation Department
Kansas City Health Department, Air Quality Section
Kansas City International Airport
Kansas City Planning and Development Department
Kansas City Power and Light
Kansas City Water and Pollution Control Department

LOCAL/REGIONAL AGENCIES (Continued)

- Gas Service
- Little Blue Valley Sewer District
- Mid-America Regional Council
- Missouri Public Service Company

PRIVATE ORGANIZATIONS AND INDIVIDUALS

- Cohen - Esrey Real Estate
- Heart of America Indian Center
- Million Air (FBO)
- SOS Extermination



CHAPTER 6
LIST OF PREPARERS AND CONTRIBUTORS

6.0 LIST OF PREPARERS AND CONTRIBUTORS

Thomas F. Adamcyk, Economist, HQ AFCEE/ECA
B.S., 1972, Education, History and Economics, Eastern Illinois University, Charleston
M.A., 1975, Economics, Eastern Illinois University, Charleston
Years of Experience: 19

Raul Alonzo, Environmental Specialist, EARTH TECH
A.A, 1980, Graphic Arts, Santa Ana Community College, California
Years of Experience: 13

Sandra E. Andres, Senior Project Environmental Professional, EARTH TECH
B.A., 1972, Sociology/Urban Studies, University of Connecticut, Storrs
M.U.P., 1979, Urban Planning, Michigan State University, East Lansing
Years of Experience: 15

Gary P. Baumgartel, Lieutenant Colonel, U.S. Air Force, P.E., Chief, HQ AFCEE/EC
B.S., 1972, Science Degree in Civil Engineering, Lowell Technological Institute, Lowell, Massachusetts
M.S., 1979, Facilities Management, Air Force Institute of Technology, School of Systems and Logistics, Wright-Patterson AFB, Ohio
Years of Experience: 22

John Bradley Beck, Captain, U.S. Air Force, HQ AFCEE/ERB
B.S., 1981, University of Minnesota
Years of Experience: 12

Daniel T. Brechbuhl, Staff Economist, EARTH TECH
B.A., 1992, Economics, University of Colorado, Boulder
Years of Experience: 2

Jon Ciarletta, Consultant, Acentech Inc.
B.A., 1987, Psychology, California State University, Northridge
M.S., 1990, Experimental Psychology, California State University, Northridge
Years of Experience: 5

Thomas C. Coates, P.E., State Airport Planner, Federal Aviation Administration
B.S., 1969, Civil Engineering, University of Missouri, Rolla, Missouri
Years of Experience: 24

Sandra Lee Cuttino, P.E., Environmental Manager, EARTH TECH
B.S., 1979, Civil Engineering, University of California, Davis
Years of Experience: 15

David Diehl, Environmental Consultant, Aviation Planning Associates, Incorporated
B.S., 1981, Aeronautics, Parks College, St. Louis University, Missouri
Years of Experience: 12

David Dischner, Senior Planner, Science Applications International Corporation
B.A., 1974, Urban Affairs, Virginia Polytechnic Institute, Blacksburg
Years of Experience: 20

Gregory T. Duecker, Senior Project Geologist, EARTH TECH
B.A., 1982, Geology, Rutgers University, New Jersey
M.S., 1985, Geology, University of California, Riverside
Years of Experience: 9

Ronald A. Dutton, Vice President, Hammer, Siler, George, Associates
B.S., 1974, Economics, University of Wyoming
M.S., 1976, Regional Economics and Utility Economics, University of Wyoming
Years of Experience: 15

Jacqueline C. Eldridge, Document Production Department Manager, EARTH TECH
B.S., 1971, Biology, Fairleigh Dickinson University, New Jersey
M.S., 1979, Marine and Environmental Science, Long Island University, New York
M.B.A., 1983, Business Administration, National University, California
Years of Experience: 17

Marion S. Erwin, Environmental Engineer, U.S. Air Force, HQ AFCEE/ECA
B.A., 1972, Biology, Cornell College, Iowa
M.S., 1975, Environmental Engineering, University of Illinois, Urbana
B.S., 1981, Civil Engineering, Southern Illinois University, Edwardsville
Years of Experience: 10

P. Mark Esch, BRAC Environmental Coordinator, OLQ, AFBCA
B.S., 1987, Civil Engineering, University of Texas, Austin
Years of Experience: 5

Dominic H. Frinzi, Jr., Assistant Chief Counsel, AFBCA
B.A., 1979, University of Wisconsin, Madison
J.D., 1988, College of William and Mary, Virginia
Years of Experience: 5

Gregory L. Fronimos, Major, U.S. Air Force, HQ AFCEE/JA
B.A., 1977, University of Michigan
J.D., 1982, Wayne State University
L.L.M., 1993, National Law Center, George Washington University
Years of Experience: 10

Jane Hildreth, Senior Project Environmental Specialist, EARTH TECH
B.S., 1983, Biology and Environmental Science, University of California, Riverside
M.S., 1989, Biology, California State University, San Bernardino
Years of Experience: 10

Moira D. Keane, Environmental Specialist, Federal Aviation Administration
B.A., 1975, Psychology, Nichols College, Dudley, Massachusetts
M.P.H., 1982, Environmental Health/Epidemiology, University of Oklahoma
Health Sciences Center, School of Public Health, Oklahoma City, Oklahoma
Years of Experience: 10

Malcolm H. Klein, Senior Consultant, Aviation Planning Associates, Inc.
B.S., 1975, Mathematics, Bucknell University, Pennsylvania
M.A., 1979, Statistics, Pennsylvania State University
M.B.A., 1982, Finance, Miami University, Ohio
Years of Experience: 11

Michael F. Larson, Environmental Engineer, HQ AFBCA/CE
B.S., 1977, Chemical Engineering, University of New Hampshire, Dunham
Years of Experience: 16

Stephen Lind, Consultant, Acentech, Inc.
B.A., 1984, Physics, University of Northern Iowa, Cedar Falls
M.S., 1988, Engineering, University of Texas at Austin
Years of Experience: 8

Richard Margiotta, Senior Transportation Analyst, Science Applications International Corporation
B.S., 1978, Biology, State University of New York, Albany
M.S., 1982, Civil Engineering, University of Tennessee, Knoxville
Years of Experience: 10

Brian C. Mayerle, Senior Staff Biologist, EARTH TECH
B.S., 1990, Environmental and Systematic Biology, California Polytechnic State University, San Luis Obispo
Years of Experience: 5

Thomas J. McGill, Deputy Office Director, EARTH TECH
A.B., 1971, Biology, Harvard College, Massachusetts
M.A., 1974, Ecology, University of California, Santa Barbara
Ph.D., 1978, Genetics, University of California, Santa Barbara
Years of Experience: 15

Joe E. Meyer, Consultant, Acentech Inc.
B.S., 1986, Mechanical Engineering, Kansas State University, Manhattan
Years of Experience: 6

Maurice E. Norton, III, Manager, Facility Engineering, EARTH TECH
B.A., 1966, Mathematics, Concordia College, Moorehead, Minnesota
Years of Experience: 26

Ramon E. Nugent, Manager of Environmental and Industrial Acoustics, Acentech, Inc.
B.S., 1969, Engineering Science, Iowa State University, Ames
Years of Experience: 23

Paige M. Peyton, Senior Project Environmental Specialist, EARTH TECH
B.A., 1987, Anthropology, California State University, San Bernardino
M.A., 1990, Anthropology/Geography, California State University, San Bernardino
Years of Experience: 8

Theresa Pohlman, Program Manager, Central Region, HQ AFBCA
B.S., 1979, Biomedical Engineering, Vanderbilt University, Nashville, Tennessee
M.S., 1993, Management, Florida Institute of Technology
Years of Experience: 15

Garey M. Reeves, Site Manager, OLQ, AFBCA
Years of Experience: 36

Sharon Rushing, Senior Staff Environmental Specialist, EARTH TECH
B.S., 1992, Anthropology, University of California, Riverside
Years of Experience: 4

J. Lee Sammons, AICP, Senior Vice President, Hammer, Siler, George, Associates
B.S.C.E., 1962, Civil Engineering, Duke University, North Carolina
Years of Experience: 29

David T. Savinsky, Chemical Engineer, Science Applications International Corporation
B.S., 1987, Chemical Engineering, University of California, Los Angeles
Years of Experience: 5

Nancy Schling, Staff Environmental Specialist, EARTH TECH
B.A., 1988, Geography, California State University, Long Beach
Years of Experience: 5

Larry Sievers, Senior Project Environmental Professional, EARTH TECH
B.S., 1988, Biology, California State University, Los Angeles
Years of Experience: 7

Wayne H. Snowbarger, Senior Environmental Professional, EARTH TECH
B.S., 1970, Civil Engineering, Colorado State University, Fort Collins
M.S., 1975, Civil Engineering, Purdue University, West Lafayette, Indiana
Years of Experience: 23

Michael J. Spray, Drafter III, EARTH TECH
B.S., 1977, Landscape Architecture, Rutgers University, New Jersey
Years of Experience: 16

Lisbeth A. Springer, Senior Environmental Planner, Science Applications International Corporation
B.A., 1975, Sociology, Colorado College, Colorado Springs
M.C.R.P., 1980, City and Regional Planning, Harvard University, Cambridge, Massachusetts
Years of Experience: 14

John Van Woensel, Manager, Aviation Planning Associates, Incorporated
B.S., 1984, Aviation Management
M.S., 1985, Contract and Acquisition Management, Florida Institute of Technology
Years of Experience: 8

Barbara Zeman, Senior Project Environmental Professional, EARTH TECH
B.S., 1976, Electrical Engineering, Rutgers University, New Jersey
M.S., 1978, Biomedical Engineering, University of Southern California, Los Angeles
Years of Experience: 12

Stephen E. Ziemer, Senior Air Quality Specialist, Science Applications International Corporation
B.S., 1976, Environmental Engineering, Southern Illinois University, Carbondale
M.S., 1978, Environmental Engineering, Southern Illinois University, Carbondale
Years of Experience: 13

Keith R. Zwick, Site Planning Manager, EARTH TECH
B.S., 1966, Landscape Architecture, Kansas State University, Manhattan
Years of Experience: 25

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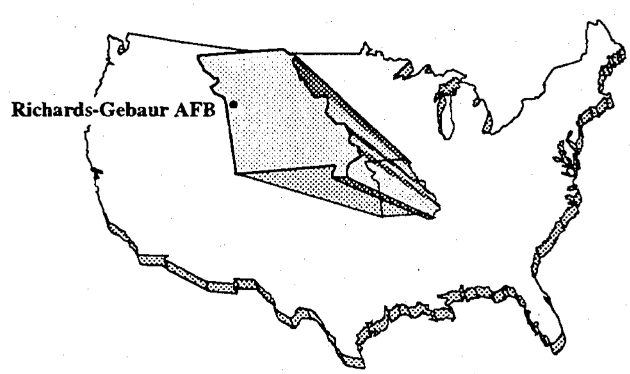

CHAPTER 7
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7.0 REFERENCES

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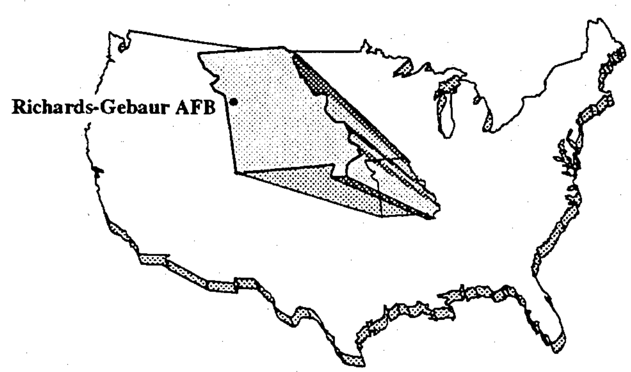

CHAPTER 8
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8.0 INDEX

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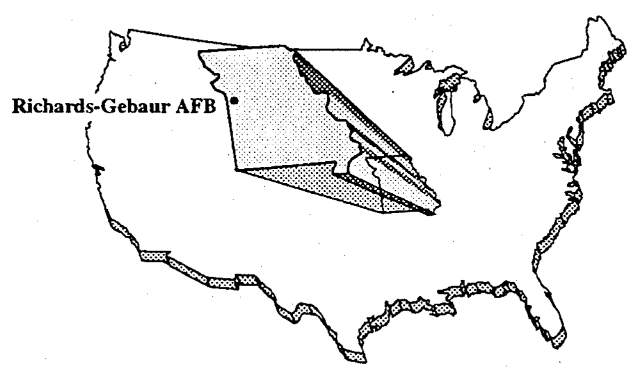

CHAPTER 9
PUBLIC COMMENTS AND RESPONSES

9.0 PUBLIC COMMENTS AND RESPONSES

INTRODUCTION

The Air Force has complied with the NEPA mandate of public participation in the EIAP primarily in three ways:

- A scoping meeting was held in Grandview, Missouri, on November 5, 1991, at which the Air Force reviewed the EIAP and invited public input regarding the disposal and reuse of Richards-Gebaur AFB.
- A public hearing was held in Grandview, Missouri, on March 23, 1994, at which the Air Force presented the findings of the DEIS for disposal and reuse of Richards-Gebaur AFB and invited public comments.
- The subject DEIS was made available for public review and comment during February through April 1994.

Public comments received both verbally at the scoping meeting and public hearing, and in writing during the response period, have been reviewed and are addressed by the Air Force in this section.

ORGANIZATION

This Public Comment and Response section is organized into several subsections, as follows:

- This Introduction, which describes the process, organization, and approach taken in addressing public comments
- A consolidated comment-response document
- An index of commentors
- A transcript of the public hearing
- Photocopies of all written comments received.

These sections are described below.

Some comments simply state a fact or an opinion, for example, "the DEIS adequately assesses the impacts on [a resource area]." Such comments, although appreciated, do not require a specific response and are not called out herein. The comments and responses are grouped by area of concern, as follows:

1.0 Air Force Policy

2.0 Purpose of and Need for Action[a]

3.0 Alternatives Including the Proposed Action

4.0 Land Transfer/Disposal

5.0 Local Community[a]

6.0 Land Use/Aesthetics[a]

7.0 Transportation[a]

8.0 Airspace[a]

9.0 Utilities[a]

10.0 Hazardous Materials/Waste Management

11.0 Soils and Geology

12.0 Water Resources

13.0 Air Quality[a]

14.0 Noise

15.0 Biological Resources[a]

16.0 Cultural Resources[a]

17.0 Socioeconomic Impact Analysis Study

Within each area, each comment-response is numbered sequentially. For example, under 3.0 Alternatives Including the Proposed Action, individual comments-responses are numbered 3.1, 3.2, etc. At the end of each numbered comment is a set of numbers that refers to the specific comment in the documents received, for example (1-3). Comment 1-3 refers to document 1, comment number 3. A reader who wishes to read the specific comment(s) received may turn to the photocopies of the documents included in this section. Below each comment number on these documents is the number of the specific comment-response within the area of concern, e.g., 3.3. Thus, the reader may reference back and forth between the comments-responses and the specific comment documents as they were received.

[a] No comments were received for this area of concern.

The list of commentors includes the name of the commentor, the identifying document number that has been assigned to it, and the page number in this section on which the photocopy of the document is presented.

1.0 AIR FORCE POLICY

1.1 Comment: The U.S. EPA, Region VII, commented that their Environmental Review and Coordination Unit has no record of any previous contact by the Air Force regarding the disposal and reuse of Richards-Gebaur Air Force Base. (7-2)

Response: As discussed in Chapter 1 of the EIS, the Air Force published a Notice of Intent to prepare an EIS in the Federal Register on October 9, 1991, and conducted a public scoping meeting in Grandview, Missouri, on November 5, 1991. The U.S. EPA, Region VII, was invited to attend, comment, and participate by letter dated October 21, 1991. We received a letter dated January 3, 1992, from the U.S. EPA, Region VII, responding to the Notice of Intent.

3.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

3.1 Comment: One of the reuse plans includes a medical facility. I understand that this is just a possibility, and that no one has specifically proposed this use, is that correct? (1-3)

Response: As AFBCA indicated at the public hearing, this use is included in order to examine the range of reasonable reuse alternatives. The only specific request for such a use has been by the U.S. Marine Corps, as presented in the Proposed Action.

3.2 Comment: Who coordinates the process of identifying a single preferred alternative from the several alternatives studied? (1-5)

Response: As a matter of Air Force policy, the local community's preferred alternative is identified as the Proposed Action in the EIS. However, the Air Force action is disposal of base property. The actual planning and implementation for reuse will be the responsibility of the new land owners.

3.3 Comment: As the officially designated reuse authority, the Kansas City, Missouri Aviation Department is submitting the current draft Chapter IV of the Richards-Gebaur Community Reuse Plan as our comments on the draft Air Force Environmental Impact Statement

for Richards-Gebaur AFB. We understand that our Community Reuse Plan will be included in the Environmental Impact Statement for the disposal and reuse of Richards-Gebaur AFB. (5-1)

Response: As indicated in Response 3.2, the Air Force has shown the Community Reuse Plan as the Proposed Action in the Final Environmental Impact Statement Disposal and Reuse of Richards-Gebaur Air Force Base, Missouri.

3.4 Comment: The document fails to identify the preferred alternative(s) (proposed action). (7-1)

Response: As discussed in Chapters 1 and 2 of the DEIS, it is Air Force policy to indicate the local community's reuse plan as the Proposed Action for the environmental analysis. As required by CEQ regulation (40 CFR 1502.14[e]), the Proposed Action/preferred alternative is identified in the FEIS. Since the community's reuse plan was not complete at the time of publication, a Proposed Action was not presented in the DEIS.

3.5 Comment: Is DOD required to approve one of the plans presented in the EIS? What happens if DOD chooses a reuse plan not presented in this document? (9-3)

Response: No, the Air Force does not have to choose one of the reuse alternatives presented in the EIS. The ROD will describe how Air Force property will be disposed (by transfers to other federal agencies, by public benefit transfers, by negotiated sales, and/or by public sales). The actual reuse of the base will be the responsibility of the new land owners.

4.0 LAND TRANSFER/DISPOSAL

4.1 Comment: Please tell me what types of homeless groups may request facilities under the McKinney Act? Have any such applications been received for Richards-Gebaur AFB and, if so, what is the status of these applications? Does this Act refer only to the homeless? (1-4)

Response: The process of requesting facilities under the McKinney Act is briefly described in Chapter 2 of the EIS. States, units of local government, and nonprofit organizations operating as "homeless providers" may apply for property under the McKinney Act. The U.S. Department of Health and Human Services has received some applications from homeless providers for facilities at Richards-Gebaur

AFB. As of the public hearing (March 23, 1994), none of these applications had been approved. All of the people serviced by the facilities operated by homeless providers must be homeless.

10.0 HAZARDOUS MATERIALS/WASTE MANAGEMENT

10.1 Comment: The U.S. Department of Health and Human Services recommends that before any land transfer occurs, the USAF should recommend, and if appropriate coordinate, the establishment of a cooperative planning body for hazardous materials and hazardous waste management, and other environmental compliance. (6-1)

Response: In Section 4.3.1.12 of the EIS, it is proposed that a cooperative planning body for hazardous materials and waste management be established with the support of the new individual operators using base property. The Air Force retains responsibility for any reuse activities that may occur prior to the Air Force action of property disposal, including during any interim lease period. However, after disposal, ultimate responsibility for implementation of mitigation measures under reuse rests with the new owners/users.

10.2 Comment: Any actions taken at the Installation Restoration Program sites, as shown in Table 3.3.2, should be detailed and brought to closure prior to issuance of the Final EIS and Record of Decision. (7-3)

Response: As explained in Section 3.3 of this EIS, the IRP is a separate program that is proceeding concurrently with the environmental impact analysis process, with its own milestones and public participation opportunities. The EIS identifies any potential impacts IRP sites and remedial actions may have on reuse. Although IRP activities may continue for years, and will not be completed before the FEIS is published, the Air Force will not dispose of a parcel of base property until all remedial action necessary to protect human health and the environment with respect to any hazardous substance remaining on the property has been taken (as defined in Section 120(h)(3) of CERCLA, as amended by the Community Environmental Response Facilitation Act).

10.3 Comments: Mitigation measures proposed for containment/removal of any hazardous/toxic materials should be discussed in the Final EIS. (7-4)

Response: See Response 10.2. The Air Force is committed to remediating all hazardous waste sites on base. Specific mitigation

measures will be developed as the IRP progresses or as part of the response actions required to comply with other applicable laws and regulations.

10.4 Comment: The U.S. EPA, Region VII, found no mention of lead sampling performed at the small arms weapons firing range. (7-5)

Response: As discussed in Section 3.3.10, Ordnance, sampling conducted at the Small Arms Range in August 1993 concluded that concentrations of lead in the soils, although greater than background levels, are below regulatory action levels and no remedial action is required (Burns and McDonnell, 1993).

11.0 SOILS AND GEOLOGY

11.1 Comment: Table 5-2 and the Summary (pg. 19) state that the No-Action Alternative would have No Impact on Geology or Soils. Considering that a number of contaminated areas were not discovered until the EBS and have not been fully evaluated, the No-Action Alternative may not prevent environmental degradation. MDNR urges the Air Force to increase the pace at which they are evaluating potential sites at the Base. (9-1)

Response: Activities under the No-Action Alternative will not affect geology, soils, or water resources. As discussed in Section 3.3 of the EIS, the closure of Richards-Gebaur AFB will not affect the ongoing IRP activities. These IRP activities will continue in accordance with federal EPA, state, and local regulatory agency regulations to protect human health and the environment, regardless of the alternatives chosen for reuse, even the No-Action Alternative. The DSMOA between Missouri and the Air Force will remain in effect to ensure joint involvement in the IRP. Also see Response 10.2.

11.2 Comment: At Page 3-60, Paragraph 5, it is stated that the coal beds in the area are found in the Mississippian-aged bedrock. Actually, the coals are Pennsylvanian in age. (9-2)

Response: Correction made in the FEIS.

12.0 WATER RESOURCES

12.1 Comment: Table 5-2 and the Summary (pg. 19) state that the No-Action Alternative would have No Impact on Water Resources.

Considering that a number of contaminated areas were not discovered until the EBS and have not been fully evaluated, the No-Action Alternative may not prevent environmental degradation. MDNR urges the Air Force to increase the pace at which they are evaluating potential sites at the Base. (9-1)

Response: See Response 11.1.

14.0 NOISE

14.1 Comment: The EIS noise analysis indicates that over the 20-year analysis period, there will be no increase in noise contours, even though the number of flight operations will increase and more operations (cargo) will be conducted at night. (1-1)

Response: As HQ AFCEE discussed at the public hearing, there are a number of factors involved in the noise analysis. The model used is the Air Force-developed, FAA-approved NOISEMAP model. The model adds a "penalty" of 10 dB to noise produced between 10 p.m. and 7 a.m. The contours shown are in DNL, which represents time-averaged noise. The two primary reasons that noise is expected to decrease over the analysis period are: (1) although there will be more flights, they will generally be by smaller, quieter aircraft than the A-10s used by the Air Force at the base, and (2) in accordance with FAA Stage 3 Noise Standards, commercial aircraft will be using quieter engines by the year 2000. A detailed explanation of the assumptions and data used in the noise analysis is presented in Appendix I of the EIS.

17.0 SOCIOECONOMIC IMPACT ANALYSIS STUDY

17.1 Comment: What is in the Socioeconomic Impact Analysis Study and when will that document be available? (1-2)

Response: As discussed briefly in the EIS, the Socioeconomic Impact Analysis Study prepared by the Air Force for the disposal and reuse of Richards-Gebaur AFB addresses the potential effects of reuse-induced changes on local population, employment, housing, public finance, schools, transportation, and utilities. Although this analysis is not required under NEPA, it is provided as a public document by the Air Force to assist the local communities in planning for the transition to civilian use of the base property. The document is scheduled for public release in summer 1994.

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UNITED STATES AIR FORCE
PUBLIC HEARING

On The

DRAFT ENVIRONMENTAL IMPACT STATEMENT

For

DISPOSAL AND REUSE

Of

RICHARDS-GEBAUR AIR FORCE BASE

At

Grandview City Hall
Grandview, Missouri

7:00 P.M.
March 23, 1994

Taylor Reporting
(816) 531-6961 Fax 531-6991
5000 Oak - 509N
Kansas City, Mo. 64112

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COLONEL JAMES HEUPEL: Good evening, ladies and gentlemen. We're going to go ahead and get started in about one minute. I think most of the people coming in have gotten in.

I want to welcome all of you to this meeting. And I want to thank you for coming out tonight. This is a public hearing on the Draft Environmental Impact Statement for the Disposal and Reuse of the Richards-Gebaur Air Force Base.

I'm Colonel Jim Heupel, and I'll be the presiding officer for tonight's meeting. This meeting is being held in accordance with the provisions of the National Environmental Policy Act and implementing regulations. Now that act requires federal agencies to analyze the potential environmental impacts of federal actions and to consider the findings of those analyses in deciding how to proceed.

The Air Force started the environmental process over two years ago. And as part of this effort on November 5th of 1991, the Air Force held a scoping meeting here in Grandview to receive your suggestions concerning what you felt should be covered in this environmental impact statement, or EIS -- and I'll refer to it as EIS throughout the

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evening. Since that meeting the Air Force has examined the environmental concerns that you raised, as well as the concerns that other people raised, and has prepared the draft environmental impact statement that is the subject of tonight's hearing.

The purpose of tonight's hearing is to receive your comments, suggestions and concerns of the draft EIS. Now those of you who have not had an opportunity to read the draft EIS or to review it, you may want to read the summary of the major findings that's in the handout available at the door and which I'm holding up right now. Those findings will also be addressed by panel members in their presentations.

Before introducing the members of the panel I'd like to explain my role in this hearing. I'm a military judge and primarily serve as a criminal trial judge for courts martial cases. So I am not an expert on this draft EIS, and I've not had any connection with its development. I'm not here to act as a legal advisor for the Air Force representative who will address these proposals. My purpose is to ensure that we have a fair, orderly hearing and that all who wish to be heard

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have a fair chance to speak.

Now I'd like to introduce the members of the public hearing panel. On my immediate right is Ms. Teresa Pohlman, representing the Air Force Base Conversion Agency. She will describe the Air Force Base disposal process.

To her right is Ms. Mora Keane, representing the Federal Aviation Administration, or FAA, which is a cooperating agency in the preparation of this EIS. She's here to clarify any issues that may arise regarding air space or FAA policy.

And to her right is Mr. Dave Farthing who is the chief of the Environmental Analysis Division at the Air Force Center for Environmental Excellence, which is located at Brooks Air Force Base, Texas. He will brief you on the environmental impact analysis process and summarize the results reported in the draft EIS.

This informal meeting is intended to provide a continuing public forum for two-way communication about the draft EIS, with a view towards improving the overall decision-making process.

You notice I said two-way communications. In the first part of this hearing process the most knowledgeable individuals will brief you on the

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details of the actions and the anticipated environmental impacts. In the second part of the process you will have an opportunity to provide information and to make statements for the record. This input ensures that the decision-makers may benefit from your knowledge of the local area and any adverse environmental effects you think may result from the proposed action or alternatives. Also, if you have any questions regarding the environmental impact analysis process or the environmental impact presented in the draft EIS, please, ask the panel members and they will answer to the extent they can. If your question is a technical one that requires further research and cannot be answered here tonight, then the Air Force will ensure that your question will be answered in the final EIS itself or in a separate comment response section.

Tonight's hearing is designed to give you an opportunity to comment on the adequacy of the draft EIS. Keep in mind that the EIS is simply intended to ensure that the decision-makers will be fully apprised of the environmental impacts associated with the various reuse alternatives before they decide on a course of action. Consequently, comments

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tonight on issues unrelated to the environmental impact statement are really beyond the scope of the hearing and should not be addressed.

Now when you came in tonight you were provided an attendance card, and on it you were asked to indicate by checking a block at the bottom if you wish to speak tonight. After Ms. Pohlman and Mr. Farthing have finished their presentations we'll have a short recess and we'll collect all the cards. Following the recess I will recognize any elected officials that wish to speak; I will recognize them to speak first. Then I'll call on members of the public in a random order from the cards that have been handed in. So for those of you that may have filled out the card but not indicated on the bottom that you wanted to speak, if you decide you want to speak as we're going through the briefing, go ahead on back to the table at the back during the recess and just fill out a new card. Or, since we have a fairly small number of people, just ask them to pull out your card and check the block "yes," and we'll make sure that we've got you in the stack that we'll be calling people to speak from.

Now if you do not feel like standing up here

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tonight and making an oral statement, you do have until April 12th of this year to submit a copy of your statement for the Air Force's consideration prior to the publication of the final EIS. The Air Force will continue to accept comments after April 12th, but the Air Force cannot guarantee that late comments will be included in the final EIS. And there are special sheets, like the one I'm holding up, that are there if you wish to use this to write any comments on. Certainly you can provide much more extensive comments if you wish to do that as well. The address that any further comments should be provided to is up on the screen. It's also located at the bottom of this statement form, and it is also located at the back page of this little pamphlet.

So even if you make comments tonight, whether you make oral comments or whether you just hand in some comments tonight, you still have until April 12th to submit any additional written comments that you wish to submit and submitting them to this address.

Now, please, don't be shy or hesitant to make a statement. I do want to ensure that all who wish to speak have a fair chance to be heard. And given the number of people that we have here, I think

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everybody that certainly wants to speak will be able to do so.

We have a court reporter here tonight who is taking down word for word everything that is said. And the verbatim record will become a part of the final environmental impact statement. Now she will only be able to make a complete record if she can hear and understand what you say, as well as what the rest of us say. So with that in mind, I would ask you to help me enforce the following ground rules:

When we get into the public comment portion, if you would, please, speak only after I've recognized you, and address your remarks to me as the hearing officer. If you have a written statement -- we'll be moving this table up by the lecturn, and there is a wire rack there that you can put any written statements in -- certainly if you have any notes that you're speaking from and that you'd be willing to leave with the reporter, she, I think, would probably appreciate having those as well.

Second, if you'd, please, speak clearly and into the microphone. Start out by stating your name and what city you're from and also the

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capacity in which you're appearing, if you're an elected official, who it is you represent; if you're speaking on behalf of an organization, the name of that; or if you're speaking as a private citizens.

Thirdly, each person will be recognized for five minutes. That includes elected officials, designated spokespersons, and private individuals. I'll keep the time myself. When you've reached five minutes I'll hold up my hand. And once I have your attention, if you'd just go ahead and wrap up your comments. You don't have to stop right there, but wrap up your comments pretty quickly. That would make sure that everybody that wants to speak will be able to speak.

And, fourthly, please, honor any requests that I may make for you to stop speaking. If you have an awful lot of comments that you want to make that will exceed that five minutes, I just ask that you prioritize your comments so that you're able to go through your most important comments first.

And, lastly, I'd just ask everyone that we have only one person speaking at a time. So I'd ask you not to speak while someone else is speaking.

One thing that I cannot stress enough is the

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fact that you may have information about environmental impacts and inputs that are unknown to us. So we're very interested in hearing and analyzing all potential environmental impacts of the alternatives that are going to be briefed tonight. You have the experience that comes from living in this area. So the second part of tonight's communication, that which comes from you to us is most important. And, please, don't be hesitant to become part of the proceedings.

At this time it's my pleasure to introduce Ms. Teresa Pohlman who will describe the Air Force Base disposal process.

MS. THERESA POHLMAN: Thank you, Colonel Heupel.

Good evening. And it's a real pleasure to be here with you in this very nice facility that you have here. My name is Teresa Pohlman and I work for the Air Force Base Conversion Agency. This is an agency created to manage the cleanup and disposal of Air Force bases that have been closed under the two base closure and relignment laws. I might mention that working for me here locally is Mr. Gary Reeves, there sitting in the back row. He is the site manager at Richards-Gebaur, and he's

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directly located on that site. He has a staff also working for him there.

Richards-Gebaur Air Force Base was selected for closure under the Defense Base Closure and Realignment Act of 1990. In discussing the disposal of Richards-Gebaur I'd like to discuss four general topics, to kind of let you know what my business is.

First, property disposal planning. Second is the objective used by the Air Force to guide its planning. Third is property disposal considerations we will use to arrive at a decision. There are several things that we must consider in arriving at this decision, and I'd like to go over those things with you. Last is the Air Force decision itself and its composition, that is, what actions the Air Force will take based on the findings in the EIS along with these other considerations that I've talked about.

Normally in all the normal situations when the government's ready to dispose of property the General Services Administration, or GSA -- you may have heard of, is responsible for disposing of federal properties for federal agencies such as the Department of Defense. However, under the 1988 Base Closure and Realignment Act and the Defense

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Base Closure and Realignment Act of 1990, the Secretary of the Air Force and the secretaries of the other services have been delegated the authority to act as the disposal agents for the federal government for their bases that are being closed. In this case it's Dr. Secretary Widnall, who is the Secretary of the Air Force, for Richards-Gebaur Air Force Base.

In carrying out her authority to dispose of the closure bases the Secretary of the Air Force, who is Dr. Sheila Widnall, will follow all laws and regulations which pertain to the disposal of all federal property. The Secretary has also issued additional guidance to the Air Force Base Conversion Agency, which is, of course, the organization I work for. You may have heard it referred to as AFBCA. We are part of the Air Force, and we do address specific disposal situations with these particular guidances.

The 1988 and 1990 Base Closure Acts require the Air Force to consult with the state governor and local government leaders when considering plans for the reuse of closure bases. The Air Force is meeting this consultation requirement by working closely with the Kansas City Aviation Department,

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referred to as the KCAD, throughout the base closure process. You may have heard them referred to as the K-CAD also.

The Air Force recognizes the significant economic impact that closure will have on local communities. And it is the Air Force's goal to complete closures as quickly and as efficiently as possible. The federal government and the Air Force are committed to assisting communities in their efforts to replace the departing military activities with viable public and private enterprises. We are dedicated to that process, and we are in the process of developing a comprehensive disposal plan at my office that attempts to balance the needs of the community and the environmental consequences of our disposal decision. To the end of making sure that economic viability returns to the community, we will consider leases for interim uses to ease the transition to civilian use.

The disposal of Air Force property is accomplished in a three-part planning process. First, the Air Force carefully considers the environmental impact of the reuse plan that is being proposed by the local community. This plan is generally adopted by the Air Force as what is

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called the Proposed Action in the environmental impact statement, or EIS.

Second, the Air Force analyzes the environmental impacts of other reasonable disposal and reuse options, so that the reasonable range of alternatives can be considered.

Third, the Air Force prepares an environmental impact statement as required by law under the National Environmental Policy Act, otherwise known as NEPA. The EIS process results in the signing of a record of decision, or ROD, that documents how the Air Force will dispose of the base property and specifies what environmental mitigation may be needed to protect human health and the environment as a result of the disposal and reuse options that have been selected.

Under current law the Air Force must give priority consideration to other federal agencies and homeless assistance providers when deciding how to dispose of the excess base property. The Air Force will inform local community representatives if any federal agencies or homeless assistance providers express interest in Richards-Gebaur Air Force Base property.

In general, the Air Force has the following

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disposal options: number one, transferring to other federal agencies; number two, public benefit transfers to states for their political subdivisions and elibible non-profit institutions; number three, negotiated sales to public agencies; and, number four, competitive sales to the general public, or what is commonly referred to as public sale. The Secretary of the Air Force will decide on the final disposal plan which will be documented in the record of decision for the public.

The last subject I'd like to address is environmental cleanup. The Air Force is very committed to cleaning up all areas contaminated by past Air Force activities as required to protect human health and the environment. Cleanup of many contaminated sites at Richards-Gebaur Air Force Base is already well underway.

If contaminated areas are not ready for transfer at the time the base closes, the Air Force will retain ownership until construction and installation of an approved remedial action is completed and the remedy has been demonstrated to be operating properly and successfully to everyone's satisfaction. After transfer the Air Force may require easements and rights-of-entry to

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permit long-term monitoring and treatment. We do not, however, expect cleanup activities to delay the reuse of parcels that do not require cleanup.

I thank you very much for your attention and the opportunity to speak with you this evening. Now I'd like to turn the meeting back over to Colonel Heupel.

COLONEL HEUPEL: Thank you, Ms. Pohlman.

Now Mr. Dave Farthing from the Air Force Center for Environmental Excellence will brief us on the environmental process.

MR. DAVE FARTHING: Thank you, Colonel Heupel.

And, good evening. I'm Dave Farthing. I'm with the Air Force's Center for Environmental Excellence that's located in San Antonio, Texas.

Our organization is conducting the environmental impact analysis for the disposal and reuse of Richards-Gebaur Air Force Base as well as all the other major installations mandated to close during Rounds One, Two and Three under the Base Closure and Relignment Act.

Tonight I would like to present the schedule for this environmental impact analysis process and show how the public comment period fits into this

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schedule. I'll also discuss the scope of the study, and finally the results of our analysis by resource category.

This environmental effort was begun on October 9th, 1991, with a notice of intent to prepare an environmental impact statement, or what I'll refer to as an EIS, for base disposal and reuse.

A scoping meeting was held here at the Grandview City Hall on November 5th, 1991, to receive public input on the scope of issues to be addressed in the EIS and to also identify reuse alternatives. During the scoping process our office received input from the public and from the Kansas City Aviation Department, the reuse authority for Richards-Gebaur Air Force Base.

Because civilian aviation operations will continue at Richards-Gebaur Airport, the Federal Aviation Administration was invited and has agreed to become a cooperating agency in the preparation of the EIS. The Air Force is working with the FAA to include their expertise and as much of their environmental requirements in the EIS as we can.

After scoping we collected the necessary data and conducted the environmental analysis. The draft EIS was filed with the U.S. Environmental

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Protection Agency on February 8th of this year.

In addition to tonight's hearing, written comments on the draft EIS will continue to be accepted at this address until April 12th, 1994. After the comment period is over we will evaluate all comments, both written and verbal, and perform additional analysis or change the EIS where it may be necessary. Again, as in the scoping process, equal consideration will be given to all comments, whether they are presented here tonight or mailed prior to April 12th.

Once the review process is complete, we will produce a final EIS, scheduled for completion this summer, and mail it to all those on the original draft EIS distribution list. If you are not on our mailing list, you can request a copy by writing to this address. The final EIS will include comments received during the public review period and our response to those comments.

The final EIS will serve as input for the record of decision which will document the disposal action to be taken by the Air Force. As you just heard from Ms. Pohlman, other studies and consideration of issues besides those addressed in the EIS will enter into the final disposal decision.

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This draft EIS was prepared to comply with the National Environmental Policy Act and the Council on Environmental Quality Regulations. Efforts were made to reduce needless bulk, write in plain language, focus only on those issues that that are clearly related to the environment, and to integrate with other documents that may be part of the decision-making process. Reuse alternatives that were developed during the scoping process were individually analyzed to provide an environmental comparison.

This analysis focuses on the impacts to the natural environment that may occur as a result of base disposal and indirectly from reuses and changes in the community. Resources evaluated include geology and soils; water, both surface and ground water; air quality; noise; biological resources; and cultural resources. Indirect changes to the community that provide measures against which environmental impact could be analyzed include changes for employment; population; land use and aesthetics; transportation; and utility services in the local communities. In addition, issues related to current and future management of hazardous

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materials and waste are discussed in the document. These issues include hazardous materials and waste; the Air Force's installation restoration program; storage tanks; asbestos; pesticides; PCBs; radon; medical or biohazardous waste management; ordnance; and lead-base paint.

If, as a result of our analysis, it was determined that adverse environmental impacts could occur through the implementation of a reuse alternative, suggested mitigation measures were identified and included in the document. Ultimate responsibility for mitigation of environmental impacts that may result from reuses of the base would be for the most part the responsibility of the future property owners.

As I mentioned earlier, this draft EIS focuses on the impacts of the natural environment that would occur either directly or indirectly from the disposal and reuse of Richards-Gebaur Air Force Base. The document addresses socio-economic factors where there is a relationship between base disposal and changes to socio-economic conditions that could result in impacts to the natural environment. Our organization is in the process of producing a separate socio-economic impact analysis

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study that is not required under the National Environmental Policy Act. It describes in greater detail how disposal and reuse of Richards-Gebaur Air Force Base may affect the economies of the surrounding areas.

When complete, copies of this document will be provided to key federal, state, and local officials and will be available for review at libraries in the area. The document will also be forwarded to the decision-maker for his consideraation in the disposal process.

In 1984, approximately 1,360 acres of Richards-Gebaur Air Force Base property, including the airfield, were conveyed to Kansas City. Since that time Kansas City has been supporting civilian aircraft operations at Richards-Gebaur Airport. And the Air Force Reserve has continued to use the runway. Richards-Gebaur Air Force Base now consists of only 426 acres, and that in itself is eleven separate parcels. The weapons bunker and mobile radio transceiver are located in Belton. The 184-acre Belton training complex is approximately four miles directly south of the other parcels in Cass County. The other eight parcels are within the jurisdiction of Kansas City.

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Air Force policy in preparing these documents is to use the plan prepared by the local reuse authority as the proposed action, and analyze that action and several reasonably foreseeable alternatives, in accordance with the National Environmental Policy Act. Because the Kansas City Aviation Department is still developing its plan, the Air Force has developed and analyzed three reasonable alternatives in the draft EIS. All three include continuing civilian aircraft operations at Richards Gebaur and incorporation of portions of the base as aviation support areas for the airport.

Since the draft was published we have received a draft reuse plan from the Kansas City Aviation Department. The Air Force will incorporate this plan as the proposed action in the final EIS.

Now I would like to present an overview of the alternatives that have been analyzed. And afterwards I will present a synopsis of the results of our analysis by resource category. Each of the alternatives contains numerous activities which may not be incluided in the title.

KCAD PROPOSED REUSE PLAN

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First, this figure shows what we now know about the community's reuse plan. This plan is not analyzed, as I said previously, in our draft EIS. But it will be incorporated as a proposed action in the final EIS. However, our initial look at this plan seemed to indicate the environmental impact resulting from this utilization would be very similar to the aviation with mixed-use alternatives which we have already analyzed in our draft EIS.

The two primary land uses of the proposed action are aviation support for a mixed-use airport and light industrial development. Aircraft operation would include general aviation; maintenance; air cargo; commuter; pilot training; and continuing military transient activity. The main runway would continue to be used, and a shortened crosswind runway would be reactivated when needed. Smaller areas would be set aside for commercial and public facilities. Some facilities, shown in white, and including the billeting complex will continue to be used by the U.S. Marine Corps for residential development. And also residential development is proposed for the Belton training complex.

AVIATION ALTERNATIVE

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The aviation alternative centers around support for a mixed-use airport with civilian aviation activities that would inclulde general aviation; commuter; maintenance; pilot training; and air cargo components, in addition to continuing military transient operations. The main runway would continue to be used, and the crosswind runway would be reactivated. The primary uses of the main base area and surrounding smaller parcels would be aviation support, industrial and public facilities. The dormitories at the billeting complex would be used for apartments, supported by the dining facility, the swimming pool, and tennis courts. The weapons bunker site and the current mobile radio transceiver site within Belton would be part of a larger area assumed to be used for industrial development. Residential development is proposed for the Belton training complex at a density of approximately three single-family units per acre.

AVIATION WITH MIXED USE ALTERNATIVE

This alternative also features continued use of the airport to support general aviation operations, using both runways. But the runways are shown in a shortened configuration. Aircraft operations would include general aviation, pilot training, and

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continuing military transient activity. Although the area proposed for aviation support would be smaller than that in the aviation alternative, this alternative would have more total aircraft aircraft operations because of the private pilot flight training activities that would occur. The acreage proposed for industrial uses is larger than that in the aviation alternative. And commercial and office uses are proposed for several areas in the main base, as are public facilities uses. The small arms range would be reused by local law enforcement agencies. And the billeting complex would support use as an institutional retreat, corporate training center, or similar educational use. The two parcels in Belton would be used for recreational purposes, possibly as an extension of the existing golf course. The Belton training complex would be used as a regional park.

INDUSTRIAL ALTERNATIVE

The industrial alternative features reuse of a large portion of the main base area for light indudtrial development. A portion of the cantonment area along the flightline would be reused for aviation support uses, to support aviation operations. Only the main runway would be used, and only general

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aviation and continuing military transient operations are assumed in this alternative. The portion of the main base area south of 155th Street and the area adjacent to the crosswind runway are proposed to be for use as a professional driver training school, for example, for law enforcement officers. The apron area would be used for on-the-road training; the motor pool would be used for vehicle storage, refueling and maintenance; and the administrative buildings could be used for offices and classrooms. A medical complex would be developed at the intersection of 155th Street and Andrews Road, consisting of offices, clinics and rehabilitation services. A small commercial area would be developed in the easternmost part of the cantonment area. The billeting complex would be used for apartments and recreational facilities. Residential development, similar to that surrounding it, is proposed for the parcels in Belton. The Belton training complex would be used for agricultural purposes, such as grazing or fodder production.

NO-ACTION ALTERNATIVE

As required by the National Environmental Act, the no-action alternative was also evaluated. Under the no-action alternative the base conditions at the time of closure would remain unchanged.

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Base property would remain under caretaker status with no civilian reuse. Caretaker activities on the base would consist of resource protection; grounds maintenance; operations as necessary of existing facilities; and building care. Civilian aviation operations at Richards-Gebaur Airport would not be affected.

The EIS analyzed impacts to various resources, broadly grouped into the categories of local community, hazardous materials and hazardous waste management, and the natural environment. The three reuse alternatives were analyzed to the same level of detail. The baseline used to prepare the impact statement was Richards-Gebaur Air Force Base at closure in September of 1994.

In general, the impacts indicated that there would be only minor impacts associated with any of the alternatives. Further, the analysis showed that there would be few differences in impacts among the three alternatives analyzed. The following slides show the comparative impacts among the reuse alternatives by resource area.

This graph shows the potential or possible increase in employment in the region due solely to reuse activities projected through the year 2014.

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These increases include the direct jobs generated on site and the secondary jobs created in Jackson and Cass Counties. Depending on the alternative implemented, reuse activities at the base could result in an additional 1,900 to 2,400 direct and secondary jobs in the region by the year 2014. Because of the large employment base in the region and expected regional growth, reuse-related employment increases would represent less than one percent of increased employment without base reuse over the 20-year period.

Little population increase is expected under the reuse alternatives as a result of workers and their families moving into the region to fill some of the jobs created by reuse. It is anticipated that most of the jobs will be filled by people already residing in the local area, and there would be little in-migration. Depending on the alternative selected, only 160 to 200 people would enter the region by 2014 as a result of reuse. These numbers are negligible compared to projected population in 2014 of 734,000.

Although there would be changes to land uses and the visual character of the base, these would be minor and could be controlled through the use of

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standard land use planning techniques to guide development. Kansas City, Belton, and Grandview may want to modify their comprehensive plans and zoning for some areas to accommodate the reuses. But this is considered only a minor effect.

The redevelopment of Richards-Gebaur Air Force Base will have little effect on local and regional transporation networks, compared to projected traffic increases due to regional growth. The local communities have plans in progress to improve some of the roads around the base due to non-reuse related traffic issues.

This chart shows the estimated number of average daily trips projected to be generated by each of the reuse alternatives. The number of daily trips to and from the site due to reuse would range from approximately 3,800 under the aviation alternative to 5,300 under the aviation with mixed-use alternative by the year 2014.

This chart shows the number of annual air operations projected through 2014 under the reuse alternatives. For reference, approximately 37,000 flight operations occurred at Richards-Gebaur Airport in 1992. At closure flight activities are projected at 39,500 operations. I would note here

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that the runway is owned by the Kansas City Aviation Department. It is not part of the property to be disposed of by the Air Force. Civilian aviation operations at Richards-Gebaur Airport would continue under any alternative. It would be difficult to project the difference in growth in civilian aviation with or without reuse of base property. Therefore, for the purposes of this environmental impact analysis we have assumed that all growth and associated impacts would be the result of reuse of Air Force property.

Based on the Air Force's preliminary airspace analysis, no adverse impacts to the region's airspace are anticipated under any reuse alternative. The selected alternative will be subject to formal airspace analysis by the FAA before implementation of any new airport layout plan.

Utility use under any of the reuse alternatives will increase less than one percent -- one percent from projections without reuse over the 20-year analysis period. These increases would be well within the capacity of regional systems as they exist today.

The Air Force is conducting investigations to identify, characterize and remediate environmental

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contamination on Richards-Gebaur Air Force Base that has resulted from past actions. This comprehensive effort is called the installation restoration program, or IRP.

The IRP includes procedures for identifying sites of contamination, determining appropriate remediation techniques, and remediating and monitoring as necessary to ensure that the site is clean. The proposed plan for cleanup of a site is distributed to the regulatory agencies for review and comment. A schedule is prepared for each part of the process at each site. The process is currently in progress at Richards-Gebaur Air Force Base through Congress. The Air Force makes information about the IRP available to the public through published information available at public libraries, as well as through the base public affairs office.

Cleanup activities will be accomplished in accordance with applicable federal, state and local regulations. Remedial actions and monitoring will continue after base closure, and long-term access to certain sites may be required to ensure the success of the remediation efforts.

The Air Force will take all necessary actions

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for environmental cleanup of the base to protect public health and the environment. Deeds of property transfer will contain this assurance, and all property transfers will be conducted in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act, commonly known as CERCLA or Superfund.

In order to comply with federal disclosure laws regarding disposal of property, the Air Force is conducting an environmental baseline survey at Richards-Gebaur Air Force Base. This effort will identify all areas of the base that may contain constraints to transfer of property. Types of constraints include contaminated sites that require remediation; presence of hazardous materials that must be properly managed to minimize health threat; and resources that are subject to federal or state protection, such as wetlands and historic properties. The environmental baseline survey results and report will be completed prior to disposal of any parcel on Richards-Gebaur Air Force Base.

Hazardous materials and waste management activities resulting from future activities would be the responsibility of the new owners and will be subject to applicable regulation. All underground

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storage tanks will be removed before closure. Above-ground storage tanks not identified for reuse will be closed in accordance with applicable regulations. All PCBs have been removed from the base.

Measured radon in this area can exceed U.S. EPA's recommended action levels. This should be considered in the design of any new residential structures. New owners of the dormitories may want to conduct radon testing before these facilities are occupied. Small amounts of medical and biohazardous waste would be generated by the clinic under the industrial alternative and would be subject to state regulation. Pesticide usage under reuse would be subject to federal and state regulations.

Lead-based paint may be present in facilities constructed before 1978. Some facilities on base contain asbestos. Demolition or renovation of these facilities should be accomplished in accordance with applicable federal, state and local regulations and would normally be the responsibility of the new owners.

The berm at the small arms range has been tested, and lead levels are below regulatory action levels. So no remedial action is necessary. Reuse

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of the range under the aviation with mixed-use alternative will require necessary maintenance procedures to remove lead regularly to prevent contamination of the soil.

Any effects of reuse on geology and soils in the area would be very minor. There would be some potential for increased erosion during construction and demolition activities, but these effects will be reduced through the use of standard erosion control practices. The soils at the Belton training complex are not suitable for septic tanks. Special design considerations would be required to provide appropriate waste-water services to the new residential development proposed there under the aviation alternative.

Projected water use under the reuse alternatives would represent an increase of less than one percent over the amount projected without base reuse. Water is supplied from the Missouri River, and the supply is more than ample to meet projected demand. There could be minor effects on surface water as a result of increased runoff during construction and demolition activities. But standard practices would minimize the adverse effects.

Air pollution emissions resulting from or

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related to reuse of the base would include carbon monoxide; nitrogen oxides; sulfur dioxide; particulate matter less than ten microns in diameter, otherwise referred to as PM10; and ozone, which is formed by the reaction of nitrogen dioxides and reactive organic gases, such as hydrocarabons. Most of the emissions would be associated with aviation activities at Richards-Gebaur Airport. The area around Richards-Gebaur Air Force Base is in attainment of federal and state standards for carabon monoxide, nitrogen oxides, sulphur dioxide, and ozone. The area is unclassified for lead and PM10. The area that is unclassified is assumed to be in attainment of standards.

Reuse-related pollutant emissions would increase over closure conditions, but that increase would represent less than one-half of one percent of the total emissions in the region of influence. Our projections indicate that none of the federal or state standards would be exceeded as a result of reuse-related emissions. Overall there will be no impact on regional or local air quality.

A commonly accepted measure of noise is DNL, the day-night average sound level. DNL is expressed in decibels, or DBs, with a penalty added for

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increased annoyance from noise during the night. Sixty-five decibels is equivalent to normal speech at three feet and is the accepted threshold for restrictions on land uses. In 1992, aircraft operations at Richards-Gebaur Airport exposed an area of approximately 679 acres to DNL 65 DB or greater. There were no residences in this area. At closure in 1994, it is expected that 271 acres will be exposed to DNL 65 DB or greater. Under all reuse alternatives the acreage exposed to DNL 65 DB or greater would be less than under preclosure conditions. No residents would be exposed to excessive noise levels as a result of aircraft operation.

I previously mentioned that the reuse-related increase in traffic on local roads would be negligible compared to projections of general regional growth. Similarly, the number of people exposed to DNL 65 DB or greater from surface traffic would be the same under all reuse alternatives as under the no-action alternative.

Biological resources include the animals and plants inhabiting the area, especially any considered threatened or endangered, as well as wetlands and other sensitive habitats. The

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vegetation on most of Richards-Gebaur Air Force Base property has been extensively altered by development, and little natural habitat remains. The U.S. Fish and Wildlife Service and the Missouri Department of Conservation have indicated that no threatened or endangered species are known to be present on the base. There are several wetland areas present along the drainages in the main base area and the Belton training complex. These total less than one acre. Because the topography along these drainages makes them unsuitable for development, the wetland areas can be avoided in reuse planning, and there would be no direct impacts. Indirect effects can be avoided through control of runoff during construction.

All of Richards-Gebaur Air Force Base property has been surveyed, and the state historic preservation officer has concurred that there are no archeological resources on the base. The Heart of America Indian Center in Kansas City has been consulted regarding traditional native American resources, and none have been identified. There are no paleontological resources on the base.

The state historic preservation officer has indicated that one facility on base, Building 602,

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may be eligible for the National Register of Historic Places. If it is determined that the builidng is eligible, conveyance for reuse would represent an impact. Under those circumstances the Air Force would consult with the state historic preservation officer and the Advisory Council on Historic Preservation to develop an appropriate mitigation plan for that building. Such measures could include placing preservation covenants in the conveyance documents.

In closing, I remind you that the study is in a draft stage. Our goal is to provide Air Force decision-makers accurate information on the environmental consequences of their actions. To do this we are solilciting your comments on this draft EIS. This information will help us better provide informed Air Force decision-making.

That concludes my presentation. I'd like to turn it back over to Colonel Heupel.

COLONEL HEUPEL: Thank you, Mr. Farthing.

At this point I'm going to take a short recess. As I mentioned at the beginning, we have the cards if anyone wishes to speak. I've been given an indication that so far we don't have any cards. So, one, I'm going to take a few minutes so

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if you decide if you have any comments you want to make; and, two, I know it's kind of warm in here. With the heat wave we've got going on outside and it's gotten warmer, you may want to take and stretch just a little bit. If you'd like to make any statements, if you have any questions about Mr. Farthing's or Ms. Pohlman's briefings and want to ask those questions, just let us know at the break. And we'll start back up in about five to eight minutes. Thank you.

(Whereupon, a recess was taken.)

COLONEL HEUPEL: Ladies and gentlemen, we'll start in with our public comment period.

Right now I've got two cards and have not been given any indication that either of these are elected officials. I've turned them over, and I don't know which card was where. So I'm going to go through in a random order and pick out the top card. And that's going to be Mr. Dave Padgett from Belton, Missouri.

Mr. Padgett, if you'd come up to the microphone, as I indicated, you just go ahead and direct your remarks to me, please.

MR. DAVE PADGETT: My name is Dave Padgett, from Belton, Missouri. I'm here representing myself.

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I thank the panel for their time to give my comment.

As I listened tonight I've heard a lot of good things about this possible reuse plan; however, there are a couple of things that do concern me as a resident of Belton and as a resident which lives very close to this airport. I understand fully that Kansas City, Missouri, owns and operates this airport; however, I would like to remind of a comment that was made to me by the Board of Aldermen in the City of Grandview. Many years ago the Air Force reached an agreement with both the City of Belton and the City of Grandview to limit night operations at that airport due to noise levels for residents of a town which they supported and a town, both, supported the U.S. Air Force at that time.

Since that time a lot of changes have taken place. And the Air Force no longer needs Richards-Gebaur. But I'd still like to mention that that agreement between the two cities should still exist to somewhat. It existed in harmony back then, and there's no reason just because the Air Force has to leave that it has to forgive the residents the support it volunteers.

The comment was made tonight that a decibel level reading was taken and tested and that through

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the next years they see no increase of over 65 DBs measured over 600-some-odd acres. I'd like to question that report of when those readings were taken and how they reached a speculative amount of DB level facing the year 2014 when they agree that operations will increase significantly through the airport based on civilian activity, this activity possibly consisting of industrial airport activity such as cargo.

If we do increase the possibility of night operations which is when most of these operations operate, twenty-four hours. But usually in the night hours they take freight out, and they bring freight in. These consist of 727s. I would venture to say that I live probably one mile from that airport, and I'd like to see a DB level of 65 be attained when a 727 takes off from that airport. I work within four miles of that airport, and I've yet to see a 65 DB level reading be taken within four miles of that airport when C130s come in.

To say that it would never reach over that again, in the year 2014 when you increase operations, that's quite a task to undertake. Either we're going to see extremely quiet aircraft or they're all consisting of very small aircraft.

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Kansas City has made a very high investment in this area. They make that investment for a reason, and that is economic return. They would like to get a return on their investment, which I understand. However, as residents that live in this area, we would like to ask that when the Air Force does up and walk away that there's some assurance that these DB levels will be monitored and watched on behalf of the residents, as the Air Force agreed to.

Now if that's not possible for the Air Force to do, we ask that the FAA step in and make their considerations known about the possibility of night operations being eliminated after the hour of ten o'clock for certain aircraft, such as 727, a large cargo plane.

I'm not objecting to economic development. I'm in business myself and look forward to economic development. But I did not move to the south of this city to move next to a fully operating airport. At the time it was told to me that the Air Force operated that as a reserve status, and that was the status it would remain. That was in 1990. No one at the airport ever contemplated in 1991 they would close it. And I know that the Air Force did not

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know that as well.

1 As I stated before, I would like to ask that if it's possible that that report of the DB levels that were taken be furnished to me possibly -- and
14.1 I can write to anyone to ask for that -- as well as how they reached that agreement. Or if it can be told to me tonight after the public comment as to how that was reached.

And, again, I don't oppose the airport. I don't oppose the plan. I oppose the night operations of possible 727s which I feel when the Air Force walks away that will become a reality, as for no one is there taking care of the base. I remind you that Kansas City, Missouri, does not have to be concerned with this, because it is surrounded by Belton and Grandview, not by Kansas City, Missouri. They have everything to gain, nothing to lose. They stated in Johnson County that they had to take it to their voters. It was turned down. Economic development was wanted, but it was not wanted at the sake of the residents. This is a residential community, and we'd like to keep it that way.

Thank you for your time.

MR. HEUPEL: Mr. Farthing, am I correct

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that the noise level contours and so on are contained in the draft of the environmental impact statement that was issued?

MR. FARTHING: Yes; they are.

If you would like to go into a lot more detail than I went through tonight to find out exactly how we did the analysis, what operations and types of aircraft -- numbers of operations and types of aircraft went into the analysis, flight tracks -- those sorts of things, the mix of day and night operations, if you'll look in Appendix I of the draft environmental statement there's a pretty thorough explanation there of how the analysis was obtained and how the results came out.

A couple of things that substantially reduce noise around airports -- one of the biggest ones, of course, is when the numbers of military operations go down substantially. When the military unit, like the reserve unit that flies those 810s out there, when they leave that in itself will have a substantial effect on reducing the noise.

Your mention of the year 2014, I think the FAA can probably help me out on this, but I think it's by the year 2000, I think all the aircraft -- commercial aircraft that you were mentioning, the

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727s and that sort of thing, I think they're supposed to be converting to a stage three which are a substantially quieter aircraft. So that also went into our analysis and have contributed to the reduction in the noise contour.

COLONEL HEUPEL: Mr. Padgett, let me ask. Have you gotten a copy of the draft EIS?

MR. PADGETT: This last one, no. I contacted the library, but they're not allowed to check it out.

COLONEL HEUPEL: We've got your address on the card.

And we can get a copy of the draft EIS sent to him; would that be right, Mr. Farthing?

MR. FARTHING: Right. We will get one to you tomorrow.

COLONEL HEUPEL: We're giving you one right now.

MR. PADGETT: That's quick enough.

MR. HEUPEL: Let me ask what the FAA -- is that -- when do the noise restrictions for commercial aircraft go into effect?

MS. MORA KEANE: That's correct. The time limit for stage two aircraft is by the year 2000. It should be all stage three aircraft by the

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year 2000 with very limited exceptions. And I wouldn't expect that limited exceptions would apply at Richards-Gebaur.

COLONEL HEUPEL: Okay. Thank you.

Now I have Mr. Dan Sheehan from Raymore, Missouri.

Mr. Sheehan.

MR. DAN SHEEHAN: Good evening. I just have a few questions for clarification. I guess, first of all, Mr. Farthing, as far as the

2 socio-economic document that you -- can you

17.1 describe that when that might be -- when that is available -- when that will be available?

MR. FARTHING: What it is, it's a document, I guess, under the old base closure laws it was required to do a socio-economic analysis. There may have been one done when the base was originally closed. Under the new Base Closure Act it was not a requirement. We took it upon ourselves because we thought in some circumstances, maybe like this one, having been familiar with the process in the past that may be expected. And so we decided in our best interests as well as the community's best interests to pull it together. In essence what it does, it looks at population

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increases; the types of employment that would occur; tax base, what would happen to that; the effects on the schools; generally how the market reacts -- standard types of socio-economic impact.

And the time frame for it, we expect that that thing should be out -- I think it's in about a month. But I think the bottom line is, we don't have a rigid -- since it's not a required document, we don't have a rigid schedule for it. We'd like to have it out within a month plus or minus of the draft for our purposes. But I would think in about a month it should be out.

3 MR. SHEEHAN: One of the things that you described in one of the reuse plans was medical

3.1 facilities. As the administrator of a local community hospital, now what you're describing in whichever plan that was, these are just possibilities or proposals, correct?

MR. FARTHING: Right.

MR. SHEEHAN: There's nobody that's come to you and said, "We'd like to do this"?

MR. FARTHING: Right. I haven't gotten any. I don't know if Ms. Pohlman has.

MS. POHLMAN: We haven't received any letters or anything like that so far as -- it's

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just an examination of a reasonable range of alternatives.

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MR. SHEEHAN: And my final question would be for Ms. Pohlman. We were discussing the McKinney Act. And she was giving me a description of how that act functions. And we got to the point where who has -- I guess I would like to know what type of homeless corporations or entities look for this type of land use, and then what type of applications you received and what stages they're at.

MS. POHLMAN: I don't know how many of you are familiar with the Stewart B. McKinney Act for homeless providers, but let me just basically step through the facts. It was formulated and passed by Congress in order to stem the cycle of homelessness in the United States. What it does essentially is, it gives a priority to homeless providers in the federal surplus property screening process. Whenever we dispose of federal lands we go through what's called a screening process. You might kind of think of it as sort of a sifting process, you know, have a priority order with a hierarchy, if you will, of orders that we dispose land to.

First in priority is other DOD agencies. For

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instance, the United States Marine Corps, the Navy, the Army, if they had expressed any kind of interest in some properties at Richards-Gebaur, they would receive first priority.

Second in priority is other federal agencies, such as the Department of Energy, you know, those kinds of agencies that might come to us.

The third thing -- and this is where the McKinney Act fits in in the priority scheme is homeless benefit conveyances. They can apply for certain properties on federal surplus properties to the Department of Health and Human Services, or HHS, for particular properties. What they have to do is come in at a certain time and apply for these properties. And HHS will consider the application. Just because they apply for these properties does not mean that they will get these properties under the act. They have to go through a rigorous screening process in order to acquire that property. If they happen to acquire that property, they are also monitored very strictly by HHS.

The other priority in the priority scheme is state and local governments.

After that we have negotiated sales.

And after that we have public sales, which

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means that if all the land has gone through the particular screening and sifts into public sale, then we offer that surplus property up for the general public to bid on, and we sell it to the general public.

The types of organizations, just to get around to your answer, the types of organizations that would be interested in acquiring property in any of the closing military bases would be mostly -- I have found in my experience anyway -- mostly interested in acquiring things like dormitories, housing, other facilities in which they can house these homeless people. I might add that most of the programs that I have heard -- 95 percent of the programs that I have heard are for homeless -- to house homeless people for a period of one year. After that those homeless individuals, give them a year to get on their feet, then they move out and are replaced by others. Or the property is turned back in to HHS and then usually give it back to the agency that surplused it in the first place.

On Richards-Gebaur I have received a few letters of interest from homeless applicants, homeless providers. These have submitted applications to the Department of Health and Human

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Services. And to date none of them have been approved. So just to give you an idea what the status is on this particular issue.

Is there anything else?

Excuse me. One more thing that I need to add. In addition to housing and dormitories, things like that, we have also seen homeless providers at other bases be approved for such things as office space and warehouse space. So they're not only interested in housing units and dormitory spaces, but they are also eligible to apply for other spaces as well, as long as they can prove that they have the proper usage for it.

Did I answer your question?

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MR. SHEEHAN: Yes. Yes; you did.

In the McKinney Act is it just homeless? Or can -- like in Cass County one of the things we're looking for is housing for Hope Haven, which is for battered women to have a place to go for them. Is it just homeless that have that kind of top priority? Or --

MS. POHLMAN: Yes; it is. It's just homeless providers, yes. And one of the stipulations that HHS makes is that all of the people serviced by this homeless provider must be

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in the homeless category. It can't be a mixture of homeless and battered women. It has to be all homeless.

COLONEL HEUPEL: That runs through the cards I've got. Let me just ask, has any of this raised any other questions or comments by any of the other people that are here, even though you may not have put down a card that you wanted to speak?

Anybody else that has anything?

Okay. Ma'am, if you would go ahead and come on up and state your name and what city you're from.

MS. LESLIE TATUM: Actually I'm a member of the media. I don't know if it's appropriate for me to ask a question.

COLONEL HEUPEL: You're still a citizen.

MS. TATUM: Okay. I'm with the Kansas City Star. My name is Leslie Tatum. And I just was curious whether anyone here knew when the Secretary of the Air Force might have a decision on the base.

MS. POHLMAN: The record of decision, which is the Air Force's official decision on the disposition of the base would be September 1994.

MS. TATUM: Okay. Thank you.

COLONEL HEUPEL: Mr. Sheehan, you had

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another question?

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MR. SHEEHAN: Well, sure. I was here for the reuse presentation where we went through the three alternatives as far as what the base could possibly be used for. I guess I asked the question there, and I'm still not sure I understand how this

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works. But when you have these three different proposals -- and I think Mr. Farthing went through those three -- and we will come up with one proposal that we will use as a recommendation to whoever to develop this land? I guess I'm not sure who coordinates this.

MR. FARTHING: What we've done in the EIS is, we went out with a marketing consultant and looked at what are the possible reuses for Richards-Gebaur Air Force Base, and went through a fairly lengthy process to derive what are the possible uses. And that was how we show in our document, the draft EIS -- that's where they came from. Those are, we think, reasonably foreseeable reuses that are out there.

As a matter of policy the Air Force uses the local community's preferred alternative, whatever they prefer, as our proposed action in our document. The City of Kansas City Aviation Department got that

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to us in January, I think it was -- about the same time that we needed to publish this document in order to support this disposal decision that needed to be made. So we're back this time with kind of a final and also to analyze the alternatives and that alternative that the City of Kansas City provides us. Then it goes to the decision-maker. The decision-maker -- once again, Teresa will be able to address this -- the decision-maker makes the decision on disposal, which is the Air Force will be disposing the property, and the local community will be reusing the property. We will get reuses for them, because those are indirect impacts to disposal decisions that will be made by the Air Force.

MS. POHLMAN: In making the disposal decision, one of the very most important factors that we consider is the community reuse plan. One of the other things -- now, remember, I talked about some of the things that we use in our disposal decision? -- the second thing is the environmental impact statement. The third thing is any other real estate analysis that we might have done by the General Services Administration, such as the highest and best use analysis or an

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appraisal or something like that. And what we try to do is overlay all of these different plans with what we see as being some of the alternatives we make. And then we will get back with the community reuse group and discuss what we call a draft disposal plan with them. When we get this draft disposal plan all meshed together with what, you know, their uses propose and what the environmental impact statement tells us are reasonable alternatives, then we will discuss these alternatives with them. There's a great emphasis now on -- and it has always been so with the Air Force -- to work with local communities and to try as much as possible to return this land in to the communities and the way they want it done. So what we're trying to do in our final record of decision, which is the official Air Force publication, is the meshing of different ideas and overlay of different ideas is to convey the community's wishes to the Secretary of the Air Force. The Secretary of the Air Force will take the document that myself and my staff will prepare and will make the final decision.

COLONEL HEUPEL: If I can, having sat through several of these hearings -- correct me if

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I'm wrong -- but these alternatives that are mentioned, as Mr. Farthing indicated, look at all of the possible types of reuses. It's a way in order for them to go through from a scientific standpoint and determine what potential environmental impacts would result if the land was to be used in a particular fashion. So the alternatives are a method by which to determine possible environmental impacts and to help rate what those environmental impacts would be. They don't necessarily indicate that there is somebody that's out there that's wanting to do it. But it's a potential. And then they can examine the environmental impacts against those possible uses.

MR. SHEEHAN: Thank you.

I would just make one other statement. And then I'm done.

I guess everybody's working behind scenes with the local politicians and that --

MS. POHLMAN: The Kansas City Aviation Department is the reuse group that's been appointed. And we have been working with them. They have also received a grant from the Department of Defense to develop the reuse plan.

MR. SHEEHAN: I guess as I see it, this

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is -- you can't have an environmental impact on this community plus the Belton area and the Kansas City, given meant limited number of attendance here. I'm kind of surprised by that. And so I hope input is coming from other directions. If not, it's our fault.

MS. POHLMAN: That's the purpose of calling public hearings and, you know, putting things in the newspaper and announcing things like that. Yes; you're absolutely right.

COLONEL HEUPEL: Is there anybody else?

(No response.)

COLONEL HEUPEL: Apparently not.

I want to thank all of you for coming out. I also want to thank the City of Grandview for the use of this facility. It's a wonderful facility, and it's been particularly good in order to be able to hold a hearing here. And we certainly appreciate the use of the facility.

Again, thank you for coming out. And this hearing is adjourned.

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C E R T I F I C A T E

STATE OF MISSOURI)
) ss:
COUNTY OF JACKSON)

I, Theresa M. Taylor, Certified Shorthand Reporter, with offices in Kansas City, Missouri, do certify that I was present at the taking of the proceedings as set forth in the caption sheet hereof; that I then and there took down in shorthand the proceedings had thereat and that the foregoing 58 pages constitute a true and correct transcript of such notes made at said time and place.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 7th day of April, 1994.

My commission expires January 6, 1998.

Theresa M. Taylor CSR
Notary Public, State of Missouri

Document 2

Mel Carnahan
Governor

Richard A. Hanson
Commissioner

State of Missouri
OFFICE OF ADMINISTRATION
Post Office Box 809
Jefferson City
65102

Stan Perovich
Director
Division of General Services

March 15, 1994

Lt Col Gary Baumgartel
Director, Environmental Conservation
and Planning Directorate
AFCEE/EC
Brooks AFB, TX 78235-5318

Dear Colonel Baumgartel:

Subject: 94020106 - Department of the Air Force
Draft EIS--Disposal and Reuse of
Richards-Gebaur Air Force Base, MO

The Missouri Federal Assistance Clearinghouse, in cooperation with state and local agencies interested or possibly affected, has completed the review on the above project application.

None of the agencies involved in the review had comments or recommendations to offer at this time. This concludes the Clearinghouse's review.

A copy of this letter is to be attached to the application as evidence of compliance with the State Clearinghouse requirements.

Sincerely,

Lois Pohl

Lois Pohl, Coordinator
Missouri Clearinghouse

LP:cm

cc: Mid-America Regional Council

Document 3

U.S. Department of Housing and Urban Development
Kansas City Regional Office, Region VII
Gateway Tower II
400 State Avenue
Kansas City, Kansas 66101-2406

March 28, 1994

Lt. Col. Gary Baumgartel
Director, Environmental
Conservation and Planning
AFCEE/EC
Brooks AFB, TX 78235-5318

Dear Mr. Foster:

SUBJECT: Draft Environmental Impact Statement (EIS) Disposal and Reuse of Richards-Gebaur Air Force Base, Kansas City, Missouri

This office has reviewed the subject draft statement for the disposal and reuse of Richards-Gebaur Air Force Base. The document was found to be in accordance with the spirit and intent of the National Environmental Policy Act and no apparent adverse impacts were noted relating to Housing and Urban Development projects in this jurisdiction.

In the past, concerns have been raised regarding noise impacts relating to surrounding housing developments. The draft statement appears to satisfactorily address noise concerns for each of the reuse alternatives. We would be interested in any additional studies relating to this specific area and the final environmental impact statement.

Thank you for the opportunity to comment.

Sincerely,

Lance Long
Lance Long
Environmental Officer

Document 4

07 APR

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Denver Federal Center, Building 56, Room 1003
P.O. Box 25007 (D-108)
Denver, Colorado 80225-0007

ER-94/157

APR 0 1 1994

Lt. Colonel Gary Baumgartel
Director, Environmental Conservation
and Planning Directorate
AFCEE/EC
Brooks AFB, Texas 78235-5318

Dear Colonel Baumgartel:

The Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement for Disposal and Reuse of Richards-Gebaur Air Force Base, Jackson and Cass Counties, Missouri. The document adequately addresses the concerns of the Department regarding fish and wildlife resources, federally listed threatened and endangered species, mineral resources, ground water resources, and recreational resources.

We appreciate the opportunity to review the subject document and provide these comments.

Sincerely,

Robert F. Stewart
Robert F. Stewart
Regional Environmental Officer

Document 5

Aviation Department

Office of the Director

Kansas City Downtown Airport
250 Richards Road, Suite 265
Kansas City, Missouri 64116-4272

(816) 842-1991
Fax (816) 421-5833

13 APR 1994

April 8, 1994

Lt. Col. Gary Baumgartel
Director, Environmental Conservation
and Planning Direct
AFCEE/EC
Brooks AFB, TX 78235-5188

Subject: Comments on Environmental Impact Statement for disposal and reuse of Richards-Gebaur AFB

Dear Lt. Col. Baumgartel:

1 As the officially designated reuse authority, the Kansas City, Missouri Aviation
Department is submitting the current draft Chapter IV of the Richards-Gebaur
Community Reuse Plan as our comments on the draft Air Force Environmental
Impact Statement for Richards-Gebaur AFB. This was presented at the recent
public hearing on March 23, 1994 at the Grandview City Hall. We are awaiting
3.3 certain decisions of the U.S. Marines to finalize this Chapter. We expect that the
Community Reuse Plan should be completed in late May or early June, 1994. We
understand that our Community Reuse Plan will be included in the Environmental
Impact Statement for the disposal and reuse of Richards-Gebaur AFB

If you have any questions, please do not hesitate to call.

Sincerely,

John D. Solomon, A.A.E.
Director of Aviation

Enclosure

cc: Ken Gaverth, Austin Co.
Gary Reeves, Transition Officer

pdr

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CHAPTER IV FINAL REUSE MASTER PLAN

The Final Reuse Master Plan selects key uses from Alternatives 1 through 3 and places them in a tight core designed as the heart of the overall base development. The alternative is constructed to create a new, strong image for the base and to offer maximum flexibility when offering land or facilities for use by the private sector. The near-term goal is the rapid creation of jobs; the long-term goal is the creation of a critical mass of activity that will attract additional development to the Southport complex.

The alternative has three key components. The first is a large area available for land assembly for such uses as light manufacturing, warehousing, and distribution. The second is an area of buildings available for start-up businesses, incubator facilities, or simply low cost, expansion space for going concerns. The third is an area reserved for educational, recreational, or cultural activities as a means of establishing a new image and generating non-business related public activity such as working museums or specialized recreation.

Air activities would include general aviation and aviation support. Infrastructure investments would be aimed at both runways (but to the east-west runway only when demand justifies), rail service to the core area, and truck-compatible road access and storage. Although individual site-related development quality would be high, area wide amenity provision (such as large areas of open space or recreation facilities) will be de-emphasized in favor of the needs of individual businesses.

Aviation Facilities:

Operations: 113,000 annually.
Runways: 18-36 in current condition. 6-24 would be opened upon demand.
Hangars: +27 positions in conventional hangars; +28 positions in T-Hangars/Port-Aport.
Apron Tie-Downs: +11 local ramp positions; +14 itinerant ramp positions.
Fuel: 120,000 gallon storage.
Terminal: No change.
Auto Parking: +12 spaces (3,800 sq. ft.)
Total Acreage: 85 acres +/-

Aviation Uses:

Target Industry Focus:

Aviation and Aviation Related Industries:
Aircraft/Helicopter Engine Overhaul and Aircraft Repair
Aviation Schools
Specialized Freight Forwarders (Small Package Delivery or Intermodal Operators)

Services: Training

Air Freight or Maintenance Operations and Aviation Training - The base is well suited for technical training of aviation-related mechanics, machinists, and pilots. Creating an aviation maintenance facility for commercial planes would give the base a specific focus

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and identity. The maximum size jet that the runway and hangers can now accommodate would be medium-sized, such as the B-727, DC-9, and others. Many of these planes are undergoing life-extensions and noise-package modifications, and this mechanical work could be easily accommodated in the current facilities at Richards-Gebaur.

The Kansas City Aviation Department recently engaged the consulting firm of Global Associates to examine the cargo potential at the Kansas City International Airport. As noted in that report and verified by our findings, there is a growing need for trained aviation pilots, mechanics, and auxilary service personnel. While Kansas City presently has a sizable pool of such talented workers, it may wish to protect this labor advantage by promoting the development of aviation-related training programs. Kansas City may be at a critical juncture in this field because other regional cities with relatively comparable aviation facilities, such as Omaha and Oklahoma City, can rely on the military to provide a steady supply of trained technical personnel. Should the Tinker Air Force Base or its affiliated maintenance depot in Oklahoma City be closed or realigned (and it was considered by the 1993 Base Closure and Realignment Commission), then Kansas City would face a particularly resource-rich rival. Many other communities with former bases, such as Chanute in Illinois, are attempting to expand/initiate aviation-related training programs. Kansas City's advantage is its TWA facilities at Kansas City International. Therefore, if the community reuse plan considers aviation training, the Kansas City Aviation Department might follow the development of the National Aviation & Training Institute, and apply for additional grants to develop technical training services through the U.S. Department of Labor, the U.S. Department of Education, and the Federal Aviation Administration.

Depending on the type of air-side activities that locate at the site, as many as 3,000 persons could be employed at Richards-Gebaur in these endeavors. Several avionics and small aircraft repair services may also be interested in moving branch locations with employment of 50-200 to the site.

Core Components:
General Aviation/Corporate Aviation, including services
Transient Military
Private Aircraft Flight Training

Related Components:
Aircraft Maintenance
Aircraft Remanufacturing/Major Overhaul
Aircraft Component Overhaul/Upgrades (e.g. engine, avionics)
Support Shops/Services (e.g. machine shops, welding, plating)
Pilot Flight Training

Future Opportunities:
Flight Training Center
Limited Passenger Operations/Terminal, including services

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CHAPTER IV FINAL REUSE MASTER PLAN

Non-Aviation Uses:

Target Industry Focus:

Light Industry/Durable Goods Manufacturing:
Industrial Machinery and Equipment
Transportation Equipment (air and auto)
Food Processing Machinery (and related packaging)
Electronics, Semiconductors, and Related Devices
Fabricated Metal Structures/Products
Lumber and Building Materials

Light Industry/Nondurable Goods Manufacturing:
Food Processing
Small Electrical Appliances
Medicinals and Veterinary Drugs

Services:
Transportation Services
Warehousing
Printing/Paper Handling

Non-Aviation Uses:

Industrial Machinery and Equipment - This major group of manufacturing establishments includes engines, turbines, elevators, industrial trucks and tractors, metalworking, hoists, power hand-tools, and office equipment. Kansas City has a high location-quotient for special industry machinery, construction, and farm equipment manufacturing. These smaller industries are projected to grow at a lower rate (.5-1%) annually than the full SIC group over the 1990-2005 period. The computer equipment manufacturing industry contributes heavily to both the growth of exports and the level of domestic output for the full SIC group. The domestic real output of manufactured computer equipment, as an industry, is projected to grow at an annual rate of 7.6 percent. While computers in 1990 accounted for just over 50 percent of the real industrial machinery and equipment output, this industry provided only 19 percent of the group's employment.

Transportation Equipment - There is a growing demand for motor vehicle and aircraft parts. The proximity of the rail, air and highway network makes the site attractive to such manufacturing. While original equipment manufacturers might locate there to serve the local Ford and General Motors plants in Kansas City, a more plausible opportunity is to obtain after-market manufacturers. Manufacturers such as Peterson, which is located in the vicinity, may employ from 150 to 500 persons, and require up to 15 acres, or 40-100,000 square feet of covered space.

The proximity of the site to transportation means that such parts can be shipped quickly, making it possible to create a focus on just-in-time manufacturing (zero or limited inventory). One particular area of expertise that Kansas City has, but which it is not capitalizing upon, is that of electric car research, particularly batteries. Richards-Gebaur has the needed buildings and facilities to perform such research.

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CHAPTER IV FINAL REUSE MASTER PLAN

Food Processing - The Kansas City area is a major food processing center. Such operations require rail and truck access, and usually occupy 10-50,000 square feet with additional land needed for storage and chemical tanks. Employment at such establishments averages 75-100.

Peripheral Computer Equipment, Semi-conductors, Circuit Boards & Electronic Components - Computer peripherals are components such as printers, hard-drives, and modems. Such manufacturing is projected to grow almost 2 percentage points above that of semiconductors and related devices, which have a 5.8 percent projected annual growth rate. The Kansas City area has several electronic component manufacturing and assembly firms that can be expected to grow. Most firms or operations in these industries are either less than 150 employees, or are very large (500+ employees). The smaller firms use between 5-25,000 square feet of light industrial space with good motor vehicle access. Increasingly these manufacturers are using just-in-time manufacturing inventory techniques that rely on high-speed truck or air transportation to distribute finished products or to receive raw materials. Required worker skills are either assembly related, customer-service/trouble-shooting and repair, or electrical design.

Instruments and Related Products - This group includes measuring, laboratory, process control, surgical, and optical instruments. It is expected to grow at the rate of 3 percent per year through the year 2010, with medical and ophthalmic equipment growing as fast as 6 percent annually. Typically these firms are small, with fewer than 50 employees. Earnings for production workers in this industrial group averaged $19-21,000 in 1989, with laboratory and optical workers earning slightly more. Firms in these industries require between 5-20,000 square feet of light industrial space, with most averaging 10,000 square feet. The raw materials used, such as steel and metal ingots/rods, wires etc. are ideally suited to transport by rail or truck, making the Richards-Gebaur site particularly attractive.

Fabricated Metals - This industry group includes a wide variety of products such as pipes, cans, plumbing fixtures, valves and wire products. The construction, automobile and food processing industries consume a large portion of these products. The industry is restructuring toward smaller sub-contract work. Growth companies are metal fabricators serving highly focused niches of low-volume, high-margin work.

Kansas City has a reasonably strong presence of metal fabricators and supporting industries and the required customer base for these products. Metal fabricating is particularly important for aviation and motor vehicle equipment manufacturers, industries that are either already operating near the Richards-Gebaur site or may be attracted to the site. Creating a "cottage industry" of such fabricators serving the building, transportation, and food processing industries could create the impetus for a large manufacturer to locate a plant in the Richards-Gebaur vicinity.

Most firms in this industry would require new buildings, rail, and highway access. Some of the strong firms rely on delivery of finished products, especially custom valves. Average size of the facilities is 10-45,000 square feet of covered space. Employment by the fabricators varies from 25 to 150 employees per firm.

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CHAPTER IV FINAL REUSE MASTER PLAN

Lumber Products - The Grandview area already is a small center of construction and lumber product activities. This is because of the area's proximity to U.S. 71 and the railroad and the availability of a large pool of blue-collar workers. One possible interim or permanent use of a large tract of land in the study site, or adjacent to it, would be for lumber products/activities. There is a steady demand for such sites and some limited interest in this expanding industrial sector. The facilities required would depend on the type of specific activity, but a minimum of 10-25 acres would be required. Depending on what type of assembling or processing is required, the employment could vary from 75 to 450.

Agricultural Chemicals, Medicinals and Vet Pharmaceuticals - This set of related, high-technology items are projected to have a strong net export growth and a domestic growth rate of 3.2 percent annually through 2005. Most operations employ approximately 125 persons, with earnings averaging above $25,000. These are targeted industries by the Kansas City Area Development Council and the region is well situated for firms to locate or expand in the region. Operations generally require anywhere from 5,000 square feet to 10 acres, depending on whether there are related storage and processing tanks and equipment, and testing facilities. Most such operations would prefer to locate in a "quality" industrial park setting.

Transportation - Trucking is projected to add 410,000 jobs nationally. The value of output of the trucking industry is projected to increase 3 percent a year, faster than the growth rate of the economy, as the freight transportation market continues to shift from rails to roads.

Wholesale Trade - This industry is projected to add 1 million jobs, bringing total employment to 7.2 million in 2005, an increase almost as fast as the average rate for all industries. The projected increase in exports of wholesale trade goods is expected to stimulate this job growth. Warehouses are particularly important to wholesalers.

Printing and Paper-handling - Kansas City is a premiere publishing center, particularly for greeting cards. This is a fast-growth industry, enjoying an annual projected growth rate of 2.3 percent. Kansas City is also a center for commercial printing, yet has relatively few manufacturers/suppliers of printing and related equipment. Richards-Gebaur could become a center of such manufacturing or distribution activities. Its location near U.S. 71 and a major rail-line increases the potential for obtaining an expanding major catalog or advertising printer.

Service Training Academies - Fire-fighting training centers have special environmental and safety considerations. Meeting the OSHA and EPA regulations is becoming increasingly difficult and expensive for training centers. This type of activity is a good candidate for interim use at Richards-Gebaur if it is done on a regional basis and focuses on aviation fire-fighting. Such a facility would provide not only a trained workforce for use at the Kansas City International and other airports, but has the particular advantage of being able to become a fire-retardant research and testing facility as well as manufacturing center. Such chemical companies are either small under-capitalized start-ups, or major manufacturers. In both cases, there is a strong market for such products and for specialized manufacturing/research facilities.

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Core Components:

- Distribution Center
- Warehousing Complex
- Transportation Support Businesses
- Small Business Park
- Light Assembly Operations
- Transportation-Oriented Museum -- Air, RR, Trucking (historical planes/displays, air shows and races, balloon races, space program exhibits, historic plane rehabilitation, aircraft construction, aviation art displays, commemorative events, experimental aircraft shows)
- Local Commercial Retail

Related Components:

- Technical Schools
- Business/University Business Incubators
- Back Office Businesses (catalogue ordering and distribution, mutual funds, insurance, credit card processing)
- Vocational Training
- Small Package Processing
- Truck Storage and Maintenance Facility
- Aviation Association Headquarters
- Police Training Facility
- Fire Training Facility

Future Opportunities:

- Medical and Biological Service Labs
- University Extension
- Mail Distribution
- Agricultural and Recreational Equipment Manufacture
- After-Market Auto Parts Manufacture
- Commercial Mini-Warehouses
- Public Transit Vehicle Maintenance and Storage
- Recycling Services
- Gateway to the Ozarks (recreational vehicle park, country music museum, sound stage, indoor recreation, civil war museum)
- Recreation Equipment Storage
- Military-related Recreation Complex

Document 5

Activity Summary

Aviation Activities

Total Acreage: 85 acres
Aviation Related Area - 20 acres
Building Area - 268,200 sq. ft.
Parking Area - 88,200 sq. ft.
Minimum Green Space - 11 acres

Non-Aviation Activities

USMC: 27 acres +/-
Existing Building Area - 200,700 sq. ft.
Buildings -- 243 - 247 - 248 - 250 - 252 - 601 - 602 - 702 - 703 - 704 - 709 - 710 - 711 - 828

Light Industrial: 57 acres +/- vacant and available for assembly
Potential Building Area - 770,000 sq. ft.
Parking Area - 346,500 sq. ft.
Minimum Green Space - 6 acres

Light Industrial/Office: 14 acres +/- with buildings
Existing Building Area - 149,000 sq. ft.
Buildings - 605 - 606 - 607 - 610 - 614 - 617 - 619 - 620

Light Industrial/Office: 14 acres +/- vacant and available for assembly
Potential Building Area - 244,000 sq. ft.
Parking Area - 219,500
Minimum Green Space - 3.4 acres

Retail: 7 acres +/- vacant and available for assembly
Potential Building Area - 152,500 sq. ft.
Parking Area - 137,000 sq. ft.
Minimum Green Area - .4 acres

Public Activity Area: 2 acres +
Potential Building Area - 23,300 sq. ft.
Parking Area - 23,400 sq. ft.
Minimum Green Area - 0.6 acres

Recreation: 4 acres

Demolish:
Buildings (Kansas City side) -- 105 - 603 - 604 - 608 - 609 - 621 - 622 - 801 - 903 - 904 - 923 - 924 - 931 - 936 - 937 - 942 - 946 - 947 - 949 - 951 - 1049 - 1050

Buildings (Belton side) -- 1100 - 1201 - 1202 - 1203 - 1205

Document 5

TABLE 1
ANNUAL REVENUE IMPACTS
FINAL REUSE MASTER PLAN

PROPERTY TAX REVENUES (WITHIN STUDY AREA)							
LAND USE CATEGORY	SQUARE FEET	VALUE/ SQ. FT.	MARKET VALUE	ASSESS. RATE	ASSESSED VALUE	TAX RATE	TAX REVENUE
Aviation	196,000	$45	$8.82MM	0.32	$2.82MM	0.0136	$38,950
Light Industry	460,000	$60	$27.6MM	0.32	$8.83MM	0.0136	$121,650
Warehouse	551,500	$40	$22.0MM	0.32	$7.04MM	0.0136	$97,150
Office	143,500	$85	$12.1MM	0.32	$3.87MM	0.0136	$53,400
Retail	152,500	$80	$12.2MM	0.32	$3.90MM	0.0136	$53,800
Total	1,503,500		$82.7MM		$26.46MM		$365,170

EARNINGS TAX REVENUES (WITHIN METROPOLITAN AREA)				
LAND USE CATEGORY	SALARY	WORKERS	TAX RATE	REVENUE
Aviation	$32,000	1023	0.01	$327,360
Light Industry	$26,000	368	0.01	$95,680
Warehouse	$22,000	232	0.01	$51,040
Office	$36,000	503	0.01	$178,050
Retail	$18,000	196	0.01	$35,280
Total		2322		$685,410

SALES TAX REVENUES (WITHIN STUDY AREA)					
LAND USE CATEGORY	SQ. FT.	SALES/ SQ. FT.	TOTAL SALES	TAX RATE	REVENUE
Retail	152,500	$195	$29.7MM	0.005	$148,700

UTILITY TAX REVENUES (WITHIN STUDY AREA)	
SQ. FT.	REVENUE
1.50MM	$250,000

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TABLE 2
ANNUAL EXPENSE IMPACTS ON METROPOLITAN AREA
FINAL REUSE MASTER PLAN

BUDGET CATEGORY	AVERAGE PER CAPITA EXPENSES	ALTERNATIVE #1	ALTERNATIVE #2	ALTERNATIVE #3	FINAL REUSE MASTER PLAN
		IMPACT OF 2443 EMPLOYEES (5880 Residents)	IMPACT OF 1488 EMPLOYEES (3880 Residents)	IMPACT OF 2507 EMPLOYEES (6117 Residents)	IMPACT OF 2322 EMPLOYEES (5865 Residents)
Economic Vitality	$331.00	$1,973,000	$1,208,000	$2,024,000	$1,878,100
Environmental Preservation	$368.00	$2,198,000	$1,346,000	$2,235,000	$2,088,000
Health and Neighborhood	$166.00	$882,700	$607,900	$1,018,000	$843,800
Policy Management	$98.00	$408,500	$250,800	$420,300	$388,230
Totals					
100% New Families		$5,573,000	$3,413,000	$5,718,000	$5,296,[illegible]
50% New Families		$2,786,000	$1,708,000	$2,858,000	$2,648,400
25% New Families		$1,393,000	$853,000	$1,429,000	$1,324,000

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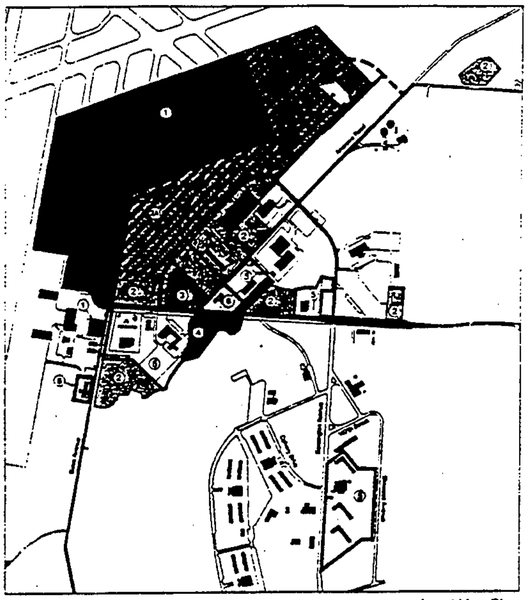

Land Use Plan
Community Base Reuse Plan

1 Aviation Support
2 Office/Industrial
2 Industrial/Warehouse
3 Commercial
4 Public/Recreation
5 Military
6 Educational/Recreational/Cultural/Government

0 250 500 1000 Feet

Figure 4.1

Document 6

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30341-3724
April 11, 1994

Lieutenant Colonel Gary Baumgartel
Director, Environmental Conservation
and Planning Directorate
AFCEE/EC
Brooks AFB, Texas 78235-5318

Dear Colonel Baumgartel:

We have completed our review of the Draft Environmental Impact Statement (DEIS) for disposal and reuse of Richards-Gebaur Air Force Base, Missouri. We are responding on behalf of the U.S. Public Health Service.

We have reviewed the Draft EIS for potential adverse impacts on human health, and we believe most of our concerns have been adequately addressed. We note that remediation of hazardous wastes sites under the Installation Restoration Program is and will continue to be the responsibility of the Air Force. A concern that we have, however, is the adequate management of hazardous materials among multiple users following base closure.

1 | 10.1 We note that the types of hazardous materials used and hazardous wastes generated in each of the alternatives are expected to be similar to those present during preclosure use. The quantities are expected to be greater than the No-Action Alternative. Because the responsibility for managing these materials would shift from a single user to multiple, independent users, the overall capability to respond to spills may be lessened. An assumption is made in the DEIS that "adequate management procedures would be implemented." We recommend that before any land transfer occurs, the USAF should recommend, and if appropriate coordinate, the establishment of a cooperative planning body for hazardous materials and hazardous waste management, and other environmental compliance. Such a cooperative planning body would help ensure proper management under applicable State and Federal regulations by all participants.

Thank you for the opportunity to review and comment on this document. Please ensure that we are included on your mailing list to receive a copy of the Final EIS, and future EIS's which may indicate potential public health impact and are developed under the National Environmental Policy Act (NEPA).

Sincerely yours,

Kenneth W. Holt

Kenneth W. Holt, M.S.E.H.
Special Programs Group (F29)
National Center for Environmental
Health

Document 7

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

April 18, 1994

Lt. Col. Gary Baumgartel, USA
Director, Environmental Conservation
and Planning Directorate
AFCEE/EC
8106 Chennault Road
Brooks AFB, TX 78235-5318

Dear Lt. Col. Baumgartel:

RE: Draft Environmental Impact Statement (DEIS) for Richards-Gebaur Air Force Base

1 | 3.4 This letter is sent in accordance with our responsibilities under Section 309 of the Clean Air Act and the National Environmental Policy Act (NEPA). The document fails to identify the preferred alternative[s] (proposed action). The document, therefore, does not meet the requirements of Section 1502.14 (e) of NEPA. Without the designation of a preferred alternative it is not possible to rate the document regarding impacts caused by the selected preferred alternative. Please coordinate with us and inform our office of your decision prior to issuance of the final document.

A rating of LO-2 has been given the DEIS. However, this rating is not an endorsement of the alternatives presented, nor should you consider the rating as meaning that the document complies with NEPA. Before EPA can consider the procedures of NEPA as having been met; you must identify the preferred alternative to be carried forward.

The following comments are provided for your consideration:

2 | 1.1 1. Region VII has found that pre-scoping coordination and scoping meetings are of great value in reducing environmental issues during the formal review process of the DEIS. Our Environmental Review and Coordination Unit has no record of any previous contact by the Air Force regarding the disposal and reuse of Richards-Gebaur Air Force Base.

3 | 10.2 2. The document's treatment of asbestos removal is adequate. However, any actions taken at the Installation Restoration Program Sites, as shown in Table 3.3.2, should be detailed and brought to closure prior to issuance of the Final EIS and Record of Decision. Site SS-008 requires more than a site inspection to determine the source of the oil sheen discovered in 1991, and site ST-005 requires greater detail regarding remediation actions.

RECYCLE

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4 | 10.3 3. Mitigation measures proposed for containment/removal of any hazardous/toxic materials should be discussed in the Final EIS.

5 | 10.4 4. Lead contamination, as it relates to paint, is handled well in the DEIS. However, we found no mention of lead sampling performed at the small arms weapons firing range. The Final EIS should address this subject and any mitigation proposed for the elimination of lead residuals found at the site.

If you have any questions regarding this project, please call Dewayne Knott at 913/551-7299. We would be pleased to meet with you to further coordinate project alternatives and compliance with NEPA.

Sincerely,

Gene Gunn

Gene Gunn, Chief
Environmental Review
and Coordination Section

cc: David C. Vangasbeck, Deputy Director of Env. Quality, Office of The Civil Engineer, Department of the Air Force Headquarters, Washington, D.C.
Lt. Col Tom Bartol, AFCEE/ESE, Norton AFB, CA 92409-6448
Marion Erwin, HQ AFCEE/ECA, 8106 Chennault Road, Brooks AFB, TX 78235-5318
Moira Keane, Airports Division ACE-615B, Federal Aviation Administration, 601 East 12th, Kansas City, Missouri 64106
Jeff Hancock, Kansas City Aviation Department, 250 Richards Road, Suite 265, Kansas City, MO 64116

Document 8

DEPARTMENT OF VETERANS AFFAIRS
Washington DC 20420

[illegible]

Headquarters HQ
USAF/CEV
Office of the Civil Engineer
1260 Air Force Pentagon
Washington, D.C. 20330-1260

Attn: David C. Vangasbeck
Deputy Director of Environmental Quality

Dear Mr. Vangasbeck:

We have reviewed the Draft Environmental Impact Statement (DEIS) for the disposal and reuse of Richards-Gebaur Air Force Base located in Missouri. We have no comments on the DEIS.

My contact on this matter is Mr. John G. Staudt, Jr., P.E., Chief, Environmental Engineering Division (138C4). Mr. Staudt may be reached on (202) 233-3729.

Sincerely,

Sanford M. Garfunkel
Associate Chief Medical Director
for Operations

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STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

RECEIVED
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April 27, 1994

Mr. P. Mark Esch
BRAC Environmental Coordinator
Building 606 Andrews Road
Richards-Gebaur AFB, MO 64147-5000

Dear Mr. Esch:

The MDNR has reviewed the draft Environmental Impact Statement (EIS) for the Base and offer the following comments for your response.

1 Table 5-2 and the Summary (pg. 19) state that the No-Action
Alternative would have No Impact on Geology, Soils or Water
Resources. Considering that a number of contaminated areas were not
11.1 discovered until the EBS and have not been fully evaluated, the no-
action alternative may not prevent environmental degradation. MDNR
12.1 urges the Air Force to increase the pace at which they are evaluating
potential sites at the Base.

2 Page 3-60, Paragraph 5 It is stated that the coal beds in the area
are found in Mississippian-aged bedrock. Actually, the coals are
11.2 Pennsylvanian in age.

MDNR believes it would be inappropriate to comment on the reuse alternatives at this time, because they are alternatives. When DOD chooses a final reuse plan MDNR will certainly look forward to review of the Final EIS. The chosen reuse plan will then dictate the level of cleanup, if any, required for disposal of the property.

3 Is DOD required to approve one of the plans presented in the EIS?
3.5 What happens if DOD chooses a reuse plan not presented in this
document?

In closing, let me emphasize the need to identify and evaluate additional IRP sites so that when a reuse plan is chosen, remediation, if necessary, will be compatible with that reuse.

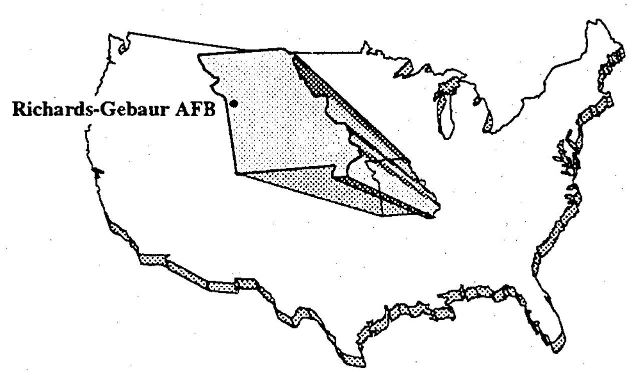
If you have any questions, feel free to contact me at (314) 751-3176.

Sincerely,

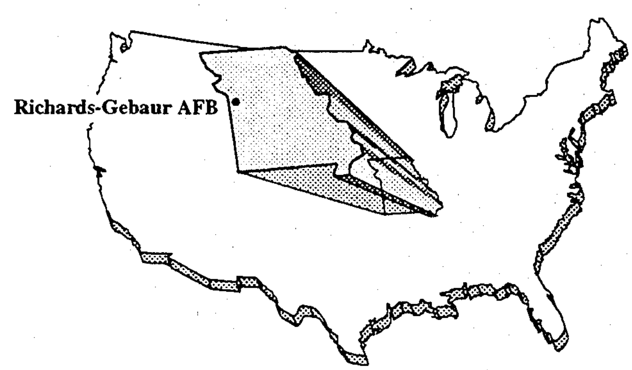
HAZARDOUS WASTE PROGRAM

Glenn S. Golson
Environmental Specialist
Federal Facilities Section

c: Mimi Garstang, DGLS
Daryl Roberts, MDOH
Karen Flourney, EPA



APPENDICES



APPENDIX A

APPENDIX A

GLOSSARY OF TERMS AND ACRONYMS/ABBREVIATIONS

APPENDIX A

GLOSSARY OF TERMS

A-Weighted Sound Level. A number representing the sound level which is frequency weighted according to a prescribed frequency response established by the American National Standards Institute (ANSI S1.4-1971) and accounts for the response of the human ear.

Advisory Council on Historic Preservation. A 19-member body appointed, in part, by the President of the United States to advise the President and Congress and to coordinate the actions of federal agencies on matters relating to historic preservation, to comment on the effects of such actions on historic and archaeological cultural resources, and to perform other duties as required by law (Public Law [P.L.] 89-655; 16 U.S. Code [U.S.C.] §470).

Aesthetics. Referring to the perception of beauty.

Aggregate. Materials such as sand, gravel, or crushed stone used for mixing with a cementing material to form concrete or alone as railroad ballast or graded fill.

Aircraft operation. A takeoff or landing at an airport.

Airshed. A region that comprises the same geographic and meteorological conditions. Ideally, emissions that occur within an airshed remain within that region by the constraints of its inherent geography and meteorology. However, ventilation of pollutants within an airshed eventually occurs and results in the transport of pollutants to adjoining airsheds.

Alluvium. Clay, silt, sand, gravel, or similar material deposited by running water.

Anticline. Linear folded rocks in which the convex side of the structure (i.e., the middle of the fold, or axis) points generally upward (concave down), and the oldest rocks are located in the center of the structure. Antonym of syncline.

Apron. An area on an airport intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, or maintenance.

Aquifer. The water-bearing portion of subsurface earth material that yields or is capable of yielding useful quantities of water to wells.

Asbestos. A carcinogenic substance formerly used widely as an insulation material by the construction industry; often found in older buildings.

Asbestos Abatement. Under the Resource Conservation and Recovery Act (RCRA) (40 Code of Federal Regulations [CFR] 763 Subpart G), any activity involving the removal enclosure, or encapsulation of friable asbestos material.

Attainment area. A region that meets federal and/or state Ambient Air Quality Standards for a criteria pollutant.

Average Daily Traffic (ADT). For a 1-year period, the total traffic volume passing a point or segment of a highway facility in both directions, divided by the number of days in the year.

Basin. A structure similar to a syncline (see Syncline), but approximating an oval or circular feature, rather than a linear feature.

Best Available Control Technology (BACT). This is a basic technology requirement of the Clean Air Act CAA. New facilities constructed in attainment areas must install BACT to control pollution. BACT is determined by states on a case-by-case basis. BACT generally is defined as (1) the most stringent emission limit or control technique that has been achieved in practice for a specific emission source or (2) any other emission control technique that is technologically feasible and cost effective for a specific emission source. Cost effectiveness usually is defined as the cost of the control technique per ton of pollutant controlled. BACT is required if the cost per ton of pollutant controlled remains below specified limits that are defined by the regulating air agency.

Biophysical. Pertaining to the physical and biological environment, including the environmental conditions crafted by man.

Capacity (roadway). The maximum rate of flow at which vehicles can be reasonably expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions.

Carbon monoxide (CO). A colorless, odorless, poisonous gas produced by incomplete fossil-fuel combustion. One of the six pollutants for which there is a national ambient air quality standard. See Criteria pollutants.

Class I, II, and III Areas. Area classifications, defined by the CAA, for which there are established limits to the annual amount of air pollution increase. Class I areas include international parks and certain national parks and wilderness areas; allowable increases in air pollution are very limited. Air pollution increases in Class II areas are less limited, and are least limited in Class III areas. Areas not designated as Class I start out as Class II and may be reclassified up or down by the state, subject to federal requirements.

Class B Airspace. Formerly terminal control areas. Controlled airspace is established around busy airports (i.e., Kansas City International, Los Angeles International, etc.) with large amounts of traffic and strict operating procedures. Aircraft operating within Class B Airspace must have appropriate equipment and pilot certification and must operate under the direction of air traffic control.

Class D Airspace. Formerly control zones with an operating control tower and airport traffic areas. Controlled airspace surrounding an airport with an operating control tower. Airports with Class D Airspace are generally less congested than those with Class B Airspace. Aircraft operating within Class D Airspace must maintain contact with air traffic control; however, equipment, pilot certification, and operating procedures are not as restrictive as under Class B airspace. Airports with Class D airspace may also have Class E Airspace if the control tower operates less than 24 hours per day.

Class E Airspace. Formerly control zones without an operating control tower, general controlled areas, and low-altitude federal airways. Controlled airspace surrounding an airport without an operating control tower. Airports with Class E Airspace are generally less congested than those with Class B Airspace. Aircraft operating within Class E Airspace have no requirement to maintain contact with air traffic control and less restrictive equipment requirements, pilot certification, and operating procedures than Class B Airspace. Airports with Class E Airspace may also have Class D Airspace if the control tower operates part time.

Clean Air Act (CAA). (42 U.S.C. 7401 et seq.). Establishes (1) national air quality criteria and control techniques (Sec. 7408); (2) national ambient air quality standards (Sec. 7409); (3) state implementation plan requirements (Sec. 7410); (4) federal performance standards for stationary sources (Sec. 7411); (5) national emission standards for hazardous pollutants (Sec. 7412); (6) applicability of Air Act to federal facilities (Sec. 7418), i.e., federal agency must comply with federal, state, and local requirements respecting control and abatement of air pollution, including permit and other procedural requirements, to the same extent as any person; (7) federal new motor vehicle emission standards (Sec. 7521); (8) regulations for fuel (Sec. 7545); (9) aircraft emission standards (Sec. 7571).

Commercial aviation. Aircraft activity licensed by state or federal authority to transport passengers and/or cargo for hire on a scheduled or nonscheduled basis.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). (42 U.S.C. 9601 - 9657, as amended). Created a mechanism for systematically removing hazardous wastes from the environment. Created the "Superfund" for cleanup of the hazardous substances located at sites placed on the National Priorities List (NPL) by the U.S. Environmental Protection Agency (EPA) and thereby identified as containing serious quantities or kinds of hazardous waste. Aimed at correction. U.S. EPA is empowered to establish liability on persons responsible for hazards on waste sites to include (1) present owners and operators, (2) former owners, (3) those who generated the hazardous substances or arranged for their disposal there, and (4) transporters to the site.

Comprehensive Plan. A public document, usually consisting of maps, text, and supporting materials, adopted and approved by a local government legislative body, which describes future land uses, goals, and policies.

Contaminants. Undesirable substances rendering something unfit for use.

Conveyance. The transfer of property from federal ownership to a nonfederal group or agency.

Corrosive. A material that has the ability to cause visible destruction of living tissue and has a destructive effect on other substances. An acid or a base.

Council on Environmental Quality (CEQ). Established by the National Environmental Policy Act (NEPA), the CEQ consists of three members appointed by the President. CEQ regulations (40 CFR 1500-1508, as of July 1, 1986) describe the process for implementing NEPA, including preparation of environmental assessments and environmental impact statements, and the timing and extent of public participation.

Criteria pollutants. The CAA required U.S. EPA to set air quality standards for common and widespread pollutants after preparing "criteria documents" summarizing scientific knowledge on their health effects. Today there are standards in effect for six "criteria pollutants": sulfur dioxide (SO_2), CO, particulate matter equal to or less than 10 microns in diameter (PM_{10}), nitrogen dioxide (NO_2), ozone (O_3), and lead (Pb).

Cultural resources. Prehistoric and historic districts, sites, buildings, objects, or any other physical evidence of human activity considered important to a culture, subculture, or a community for scientific, traditional, religious, or any other reason.

Cumulative impacts. The combined impacts resulting from all activities occurring concurrently at a given location.

Day-Night Average Sound Level (DNL). The 24-hour average-energy sound level expressed in decibels, with a 10-decibel penalty added to sound levels between 10:00 p.m. and 7:00 a.m. to account for increased annoyance due to noise during night hours.

Decibel (dB). A unit of measurement on a logarithmic scale which describes the magnitude of a particular quantity of sound pressure or power with respect to a standard reference value.

Disposal. Legal transfer of Air Force property to other ownership.

Dome. A structure similar to an anticline (see Anticline), but approximating an oval or circular feature, rather than a linear feature.

Easement. A right or privilege (agreement) that a person may have on another's property.

Endangered species. A species that is threatened with extinction throughout all or a significant portion of its range.

Endangered Species Act. (16 U.S.C. 1531 et seq.). Requires federal agencies, in consultation with Department of Interior, to take action necessary to insure that agency actions do not jeopardize endangered or threatened species or their critical habitat.

Environmental Baseline Survey (EBS). Documents the physical condition of Air Force real property resulting from the storage, use, and/or disposal of hazardous substances or petroleum products and their derivatives. The EBS assists the Air Force in meeting its obligations under CERCLA, as amended by the Community Environmental Response Facilitation Act (CERFA). An EBS is required by Department of Defense (DOD) policy before any property can be sold, leased, transferred, or acquired.

Environmental Impact Analysis Process (EIAP). The process of conducting environmental studies as outlined in Air Force Regulation 19-2.

Erosion. Wearing away of soil and rock by weathering and the action of streams, wind, and underground water.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Originally enacted in 1947, this constitutes the basic federal regulatory framework governing pesticides. The Act describes the registration and classification of pesticides, the controls imposed upon their application, use and handling, and gives U.S. EPA authority to delegate enforcement responsibilities to state agencies.

Federal Water Pollution Control Act (Clean Water Act). (33 U.S.C. 1251 et seq.). Establishes (1) water quality standards for discharge of pollutants from point sources (Sec. 1311), (2) area wide planning process for waste treatment management and water quality control from non-point sources (Sec. 1288), (3) grant programs, and (4) oil, hazardous substance and vessel sewage regulations. Federal agency must comply with federal, state, and local requirements respecting control and abatement of water pollution, including permit and other procedural requirements, to the same extent as any person (Sec. 1323).

Fleet mix. Combination of aircraft used by a given agency.

Floodplain. The lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands. Includes, at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year (100-year floodplain).

Frequency. The time rate (number of times per second) that the wave of sound repeats itself, or that a vibrating object repeats itself--now expressed in Hertz (Hz), formerly in cycles per second (cps).

Friable. Easily crumbled or reduced to powder.

General aviation. All aircraft which are not commercial or military aircraft.

Groundwater. Water within the earth that supplies wells and springs.

Habituate. To become accustomed to frequent repetition or prolonged exposure.

Hazardous air pollutants. Pollutants listed under Section 112 of the CAA, which present, or may present, through inhalation or other routes of exposure, a threat of adverse human health effects or adverse environmental effects as a result of emissions to the air.

Hydrocarbons. Any of a vast family of compounds containing hydrogen and carbon. Used loosely to include many organic compounds in various combinations; most fossil fuels are composed predominately of hydrocarbons. Hydrocarbons in the atmosphere mix with nitrogen oxides in the presence of sunlight to form ozone.

Hydrology. A science dealing with the properties, distribution, and circulation of water both above and below the earth's surface.

Impacts. An assessment of the meaning of changes in all attributes being studied for a given resource; an aggregation of all the adverse effects, usually measured using a qualitative and nominally subjective technique. In this environmental impact statement, as well as in the CEQ regulations, the word impact is used synonymously with the word effect.

Infrastructure. The basic installations and facilities on which the continuance and growth of a local community, state, etc., depend (roads, schools, power plants, transportation and communication systems, etc.)

Lacustrine. Of or having to do with a lake or lakes.

L_{eq}. The equivalent steady state sound level, which in a stated period of time would contain the same acoustical energy as time-varying sound level during the same period.

L_{max}. The highest A-weighted sound level observed during a single event of any duration.

Lead (Pb). A heavy metal used in many industries, which can accumulate in the body and cause a variety of negative effects. One of the six pollutants for which there is a national ambient air quality standard. See Criteria pollutants.

Level of service (LOS). In transportation analyses, a qualitative measure describing operational conditions within a traffic stream and how they are perceived by motorists and/or passengers.

Loudness. The qualitative judgment of intensity of a sound perceived by a human being.

Masking. The action of bringing one sound (audible when heard alone) to inaudibility or to unintelligibility by the introduction of another sound.

Military Operations Area (MOA). Airspace areas of defined vertical and lateral limits established for the purpose of separating certain training activities, such as air combat maneuvers, air intercepts, and acrobatics, from other air traffic operating under instrument flight rules.

Mineral resources. Mineral deposits that may eventually become available; deposits not recoverable at present or yet undiscovered.

Mitigation. A method or action to reduce or eliminate program impacts.

National Ambient Air Quality Standards (NAAQS). Section 109 of the CAA requires EPA to set nationwide standards, the NAAQS, for widespread air pollutants. Currently, six pollutants are regulated by primary and secondary NAAQS: CO, Pb, NO_2, O_3, PM_{10}, and SO_2. See Criteria pollutants.

National Environmental Policy Act (NEPA) (P.L. 91-190, 42 U.S.C. §§4321 et seq.). Passed by Congress in 1969, the Act established a national policy designed to encourage consideration of the influences of human activities (e.g., population growth, high-density urbanization, industrial development) on the natural environment. NEPA also established the CEQ. NEPA procedures require that environmental information be made available to the public before decisions are made. Information contained in NEPA documents must focus on the relevant issues in order to facilitate the decision-making process.

National Historic Preservation Act of 1966 (NHPA) (P.L. 89-665; 80 Stat. 915; 16 U.S.C. §§470 as amended). An act to establish a program for the preservation of historic properties throughout the nation. The Act authorizes the Secretary of the Interior to "expand and maintain a national register of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture, hereinafter referred to as the National Register..." This Act also establishes an independent agency of the U.S. government, the Advisory Council on Historic Preservation, to "advise the President and the Congress on matters relating to historic preservation" and to implement and monitor the NHPA.

National Priorities List (NPL). A list of sites (federal and state) where releases of hazardous materials may have occurred and may cause an unreasonable risk to the health and safety of individuals, property, or the environment.

National Register of Historic Places. A register of districts, sites, buildings, structures, and objects important in American history, architecture, archaeology, and culture, maintained by the Secretary of the Interior under authority of Section 2(b) of the Historic Sites Act of 1935 and Section 101(a)(1) of the NHPA of 1966, as amended.

Native Americans. Used in a collective sense to refer to individuals, bands, or tribes who trace their ancestry to indigenous populations of North America prior to Euro-American contact.

Nitrogen dioxide (NO_2). Gas formed primarily from atmospheric nitrogen and oxygen when combustion takes place at high temperature. NO_2 emissions contribute to acid deposition and formation of atmosphere ozone. One of the six pollutants for which there is a national ambient air quality standard. See Criteria pollutants.

Nitrogen oxides (NO_x). Gases formed primarily by fuel combustion, which contribute to the formation of acid rain. Hydrocarbons and NO_x combine in the presence of sunlight to form ozone, a major constituent of smog.

Noise. Any sound that is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying (unwanted sound).

Noise attenuation. The reduction of a noise level from a source by such means as distance, ground effects, or shielding.

Noise contour. A line connecting points of equal noise exposure on a map. Noise exposure is often expressed using the average day-night sound level, DNL.

Nonattainment area. An area that has been designated by U.S. EPA or the appropriate state air quality agency as exceeding one or more National or State Ambient Air Quality Standards.

100-year floodplain. See floodplain.

Operable Unit. One or more Installation Restoration Program sites grouped together because of similar geographic area, types of contamination, or cleanup methods.

Operating Location (OL). An organizational element of the Air Force Base Conversion Agency located at a closing base. The OL is responsible for the care and custody of closed areas of the base, disposal of real and related personal property, and environmental cleanup. This office is the primary point of contact for local community reuse organizations and the general public who deal with the disposal and reuse of the base.

Ozone (O_3)(ground level). A major ingredient of smog. Ozone is produced from reactions of hydrocarbons and NO_x in the presence of sunlight and heat. One of the six pollutants for which there is a national ambient air quality standard. See Criteria pollutants.

Ozone precursors. Emitted air pollutants that chemically combine to produce ozone in the presence of sunlight.

Paleontology. The study of life in past geologic time, based on fossil plants and animals.

Paleozoic. A stratigraphic era representing rocks formed between approximately 570 million and 225 million years before present.

Particulate matter. Solid particles consisting of dust, soot, and various types of chemical species that have been emitted into the atmosphere and can remain suspended for several days or weeks. PM_{10} can be hazardous to human health because it is small enough to penetrate the lung's natural defenses and may contain toxic or other chemicals that present a health concern. One of the six pollutants for which there is a national ambient air quality standard. See Criteria pollutants.

PCBs. See Polychlorinated biphenyls.

PCB-contaminated equipment. Equipment that contains a concentration of polychlorinated biphenyls (PCBs, see definition) from 50 to 499 ppm and is regulated by U.S. EPA.

PCB equipment. Equipment that contains a concentration of PCBs of 500 parts per million or greater and is regulated by U.S. EPA.

Perched aquifer. Unconfined groundwater (often in relatively small quantities in comparison to other groundwater in the area) separated from an underlying main body of groundwater by an unsaturated zone. The perched groundwater is kept from flowing down to the main aquifer by an

impermeable layer of material (e.g., a clay layer in unconsolidated sediments, formations of caliche hard pans in some arid alluvial sediments, or one of several types of sedimentary rocks).

Permeability. The capacity of a porous rock or sediment to transmit a fluid.

Pesticides. Any substance, organic or inorganic, used to destroy or inhibit the action of plant or animal pests; the term thus includes insecticides, herbicides, fungicides, rodenticides, miticides, fumigants, and repellents. All pesticides are toxic to humans to a greater or lesser degree. Pesticides vary in biodegradability.

pH. A scale (from 1 to 14) used to measure acidic or basic level of a material. A pH of 1 is highly acidic, 7 is neutral, and 14 is highly basic.

Physiographic province. A geographic region in which all parts are similar in geologic structure and climate.

Pleistocene. The early epoch of the Quaternary Period that refers to the rocks formed during the "ice age" beginning approximately 3 million years ago and ending approximately 10,000 years ago.

PM_{10}. See Particulate matter.

Polychlorinated biphenyls (PCBs). Any of a family of industrial compounds produced by chlorination of biphenyl. These compounds are noted chiefly as an environmental pollutant that accumulates in organisms and concentrates in the food chain with resultant pathogenic and teratogenic effects. They also decompose very slowly.

Polycyclic Aromatic Hydrocarbons (PAHs). Also referred to as Polynuclear Aromatic Hydrocarbons. PAHs are formed during the incomplete combustion/oxidation of coal, oil, gas, garbage, as well as other organic substances and are classified as probably human carcinogens by U.S. EPA.

Potable water. Suitable for drinking.

Prairie (tall-grass prairie). The temperate grasslands of central North America. Temperate grasslands occur in the interior portion of continents where insufficient moisture is available to support forests or woodlands. Tall-grass prairie is the easternmost prairie community, comprised of grasses generally greater than five feet in height.

Prevention of Significant Deterioration (PSD). In the 1977 Amendments to the CAA, Congress mandated that areas with air cleaner than required by national ambient air quality standards must be protected from significant deterioration. The CAA's PSD program consists of two elements: requirements for best available control technology on major new or modified sources, and compliance with an air quality increment system.

Prevention of Significant Deterioration Area. A requirement of the CAA that limits the increases in ambient air pollutant concentrations in attainment areas to certain increments even though ambient air quality standards are met.

Prime farmland. Environmentally significant agricultural lands protected from irreversible conversion to other uses by the Farmland Protection Policy Act.

Remediation. The process of removing or detoxifying environmental contamination.

Residuum. An accumulation of rock debris formed by weathering of bedrock; the debris forms a layer of variable thickness on top of the bedrock. Generally, residuum contains less soluble or chemically altered minerals from the parent rock.

Resource Conservation and Recovery Act (RCRA). (42 U.S.C. 6901 - 6992k). Governs the "treatment, storage, transportation and disposal of hazardous wastes which have adverse effects on health and the environment." Is sometimes referred to as the "from cradle to grave" law because it places permanent responsibility on the generator of hazardous waste for its effects. Aimed at prevention but often overlaps CERCLA cleanup responsibilities. Establishes (1) solid waste management guidelines (Sec. 6907), (2) comprehensive scheme for managing hazardous wastes (Sec. 6921 et seq.), (3) state and regional solid waste plan requirements (Sec. 6941 et seq.) Also regulates underground storage tanks (Sec. 6991 et seq.). Federal agency must comply with federal, state, and local requirements, both substantive and procedural, to the same extent as any person (Sec. 6961).

Reuse. Development plan for use of former Air Force property after base closure.

Riparian. Of or on the bank of a natural course of water.

Runway protection zones (RPZs). An area at ground level beyond the runway end; designed to enhance the safety of aircraft operations.

Scarp. A surface feature that is a relatively straight, cliff-like face or slope, generally of considerable linear extent. Commonly used to refer to features caused by vertical movement on faults.

Sediment. Rock and mineral material that originated from weathering of rocks, is transported, and is deposited by wind, water, or ice.

Seismicity. Relative frequency and distribution of earthquakes.

Shrink-swell potential. A measure of the amount that clay minerals in soil will expand when moisture is added, and contract when dried. An important consideration for designing building foundations.

Single-family housing. A conventionally built house consisting of a single dwelling unit occupied by one household.

Solvent. A substance that dissolves or can dissolve another substance.

Sound. The auditory sensation evoked by the compression and rarefaction of the air or other transmitting medium.

State Historic Preservation Officer (SHPO). The official within each state, authorized by the state at the request of the Secretary of the Interior, to act as liaison for purposes of implementing the NHPA.

Statute mile. Unit of distance equal to 5,280 feet.

Sulfur dioxide (SO_2). A toxic gas that is produced when fossil fuels, such as coal and oil, are burned. SO_2 is the main pollutant involved in the formation of acid rain. SO_2 also can irritate the upper respiratory tract and cause lung damage. The major source of SO_2 in the United States is coal-burning electric utilities. One of the six pollutants for which there is a national ambient air quality standard. See Criteria pollutants.

Superfund Amendments and Reauthorization Act (SARA). (P.L. 99-499 [1986], 42 U.S.C. 11001 - 11050). An amendment of CERCLA that created the Defense Environmental Restoration Program (DERP) and the trust fund account for cleanup of sites on defense installations (DERA). It also addresses cleanup of leaking underground storage tanks and expands community right-to-know regarding facilities at which hazardous substances are present (SARA Title III). Title III does not apply to federal facilities but Air Force installations are directed to "comply with the objectives of the act to the extent practicable".

Syncline. Folded rocks in which the convex side of the structure (i.e., the middle of the fold, or axis) points generally down (concave up), and the youngest rocks are located in the center of the structure. Antonym of anticline.

Threatened species. Plant and wildlife species likely to become endangered in the foreseeable future.

Toxic Substances Control Act (TSCA). (15 U.S.C. 2601 et seq.). Requires reporting of naturally occurring chemical substances used in manufacturing and of commercially imported chemicals and authorizes regulation by EPA.

Traffic volume. The number of vehicles passing a point on a lane, roadway, or other trafficway during some time interval.

Transfer. Deliver U.S. government property accountability to another federal agency.

Trip generation. A determination of the quantity of trip ends associated with a parcel of land.

U.S. Environmental Protection Agency (EPA). The independent federal agency, established in 1970, that regulates federal environmental matters and oversees the implementation of federal environmental laws.

Victor airways. A nationwide network of commonly used flight routes, based on the very high frequency omni-directional range (VOR) navigation system, extending from 1,200 feet above ground level to 18,000 feet above mean sea level.

Volatile organic compound (VOC). Compounds containing carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides, metallic carbonates, and ammonium carbonate. By EPA regulatory definition, VOCs do not include methane or other nonreactive hydrocarbons such as methylene chloride.

Wetlands. Areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil. This classification includes swamps, marshes, bogs, and similar areas. Jurisdictional wetlands are those wetlands that meet the hydrophytic vegetation, hydric soils, and wetland hydrology criteria under normal circumstances, or meet the special circumstances as described in the U.S. Army Corps of Engineers wetland delineation manual (1987) where one or more of these criteria may be absent and are a subset of "waters of the United States."

Zoning. The division of a municipality (or county) into districts for the purpose of regulating land use, types of building, required yards, necessary off-street parking, and other prerequisites to development. Zones are generally shown on a map and the text of the zoning ordinance specifies requirements for each zoning category.

ACRONYMS/ABBREVIATIONS

AADT	average annual daily traffic
ACM	asbestos-containing material
ADT	average daily traffic
AFB	Air Force Base
AFBCA	Air Force Base Conversion Agency
AFFF	aqueous film-forming foam
AFR	Air Force Regulation
AGL	above ground level
AHERA	Asbestos Hazard Emergency Response Act
ALP	airport layout plan
APE	area of potential effect
ARTCC	Air Route Traffic Control Center
AST	aboveground storage tank
ATC	air traffic control
ATCT	Air Traffic Control Tower
BACT	Best Available Control Technology
BRL	Building Restriction Line
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CPSC	Consumer Product Safety Commission
CSR	Code of State Regulations
dB	decibel
DBCRA	Defense Base Closure and Realignment Act
DD	Decision Document
DEIS	Draft Environmental Impact Statement
DERP	Defense Environmental Restoration Program
DNL	day-night average sound level
DOD	Department of Defense
DOT	Department of Transportation
DRMO	Defense Reutilization and Marketing Office
DSMOA	Defense-State Memorandum of Agreement
EBS	Environmental Baseline Survey
EDMS	Emissions and Dispersion Modeling System
EIAP	environmental impact analysis process
EIS	Environmental Impact Statement

EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
°F	degrees Fahrenheit
FAA	Federal Aviation Administration
FBO	fixed base operator
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FPMR	Federal Property Management Regulations
FPPA	Farmland Protection Policy Act
FS	feasibility study
FW	Fighter Wing
GPD	gallons per day
GPS	global positioning system
GSA	General Services Administration
HAP	hazardous air pollutant
HHS	U.S. Department of Health and Human Services
HMTA	Hazardous Materials Transportation Act
HUD	U.S. Department of Housing and Urban Development
HWMP	Hazardous Waste Management Plan
I	Interstate
IAP	Initial Accumulation Point
IFR	instrument flight rules
ILS	instrument landing system
IRA	interim remedial action
IRP	Installation Restoration Program
JP	jet petroleum
KCAD	Kansas City Aviation Department
KCAQP	Kansas City Air Quality Program
KCI	Kansas City International
KCP&L	Kansas City Power and Light
KCSL	Kansas City Southern Lines
kVA	kilovolt ampere
LBPPPA	Lead-Based Paint Poisoning Prevention Act
L_{dn}	day-night average sound level
LEPC	Local Emergency Planning Committee
L_{eq}	equivalent sound level
L_{max}	A-weighted maximum sound level
LOS	level of service
M	Missouri Highway
MACT	maximum achievable control technology
MARC	Mid-America Regional Council
MDC	Missouri Department of Conservation

MDNR	Missouri Department of Natural Resources
MERC	Missouri Emergency Response Commission
$\mu g/m^3$	micrograms per cubic meter
MGD	million gallons per day
MMCF/day	million cubic feet per day
MOA	Military Operations Area
MOGAS	motor gasoline
MPS	Missouri Public Service
MSA	Metropolitan Statistical Area
MSDS	material safety data sheet
MSL	mean sea level
MTR	military training route
MW	megawatt
MWH	megawatt-hour
MWH/day	megawatt-hours per day
N_2O	nitrous oxide
N_2O_3	nitrous anhydride
N_2O_4	nitrogen tetroxide
N_2O_6	nitric anhydride
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NCP	National Contingency Plan
NDI	nondestructive inspection
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NFAP	no further action planned
NHPA	National Historic Preservation Act
NO	nitric oxide
NO_2	nitrogen dioxide
NO_3	nitrogen trioxide
NOI	Notice of Intent
NOISEMAP	Noise Exposure Model
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NSR	New Source Review
O_3	ozone
OIP	office/industrial park
OL	Operating Location
OSHA	Occupational Safety and Health Administration
OWS	oil/water separator
P.L.	Public Law
PA	preliminary assessment

PA/SI	preliminary assessment/site inspection
PCB	polychlorinated biphenyl
pCi/l	picocuries per liter
PM_{10}	particulate matter equal to or less than 10 microns in diameter
POL	petroleum, oil, and lubricants
ppm	parts per million
PSD	Prevention of Significant Deterioration
RA	remedial action
RAMP	Radon Assessment and Mitigation Program
RAPCON	radar approach control
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RD/RA	remedial design/remedial action
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
RPZ	runway protection zone
ROI	Region of Influence
SAGE	Semi-Automatic Ground Environment
SARA	Superfund Amendments and Reauthorization Act
SEL	sound exposure level
SHPO	State Historic Preservation Officer
SI	site inspection
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SQG	Small Quantity Generator
TACAN	tactical air navigation
TD	Technology Development
TDS	total dissolved solids
TPD	tons per day
TRACON	terminal radar approach control
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, and Disposal
TSP	total suspended particulates
US	U.S. Highway
U.S.C.	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VFR	visual flight rules
VOC	volatile organic compound

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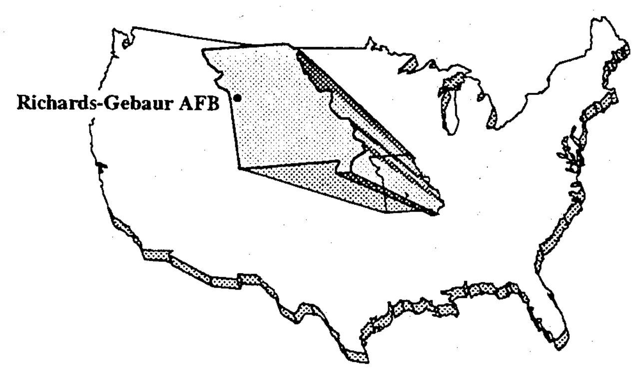

APPENDIX B

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NOTICE OF INTENT

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NOTICE OF INTENT

The following notice of intent was circulated and published by the Air Force in the October 9, 1991, Federal Register in order to provide public notice of the Air Force's intent to prepare an Environmental Impact Statement of disposal and reuse of Richards-Gebaur Air Force Base. This Notice of Intent has been retyped for clarity and legibility.

Please note: The point of contact for information on the disposal and reuse Environmental Impact Statement has been changed. The new point of contact is:

Mr. Jonathon D. Farthing
Chief, Environmental Analysis Division
HQ AFCEE/ECA
8106 Chennault Road
Brooks AFB, TX 78235-5318

NOTICE OF INTENT
TO PREPARE ENVIRONMENTAL IMPACT STATEMENTS
FOR DISPOSAL AND REUSE OF THIRTEEN AIR FORCE BASES

The United States Air Force will prepare thirteen environmental impact statements (EISs) to assess the potential environmental impacts of disposal and reuse of the following Air Force bases recently directed to be closed under the provisions of the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510, Title XXIX):

<u>Closing Base</u>

Bergstrom AFB, Austin, Texas

Carswell AFB, Fort Worth, Texas

Castle AFB, Merced, California

Eaker AFB, Blytheville, Arkansas

England AFB, Alexandria, Louisiana

Grissom AFB, Peru, Indiana

Loring AFB, Limestone, Maine

Lowry AFB, Denver, Colorado

Myrtle Beach AFB, Myrtle Beach, South Carolina

Richards Gebaur ARS, Kansas City, Missouri

Rickenbacker AGB, Columbus, Ohio

Williams AFB, Chandler, Arizona

Wurtsmith AFB, Oscoda, Michigan

Each EIS will address the disposal of the property to public or private entities and the potential impacts of reuse alternatives. All available property will be disposed of in accordance with provisions of Public Law 101-510 and applicable federal property disposal regulations.

The Air Force plans to conduct a scoping and screening meeting within the local area for each base during October and November 1991. Notice of the time and place of each meeting will be made available to public officials and local news media outlets once it has been finalized. The purpose of each meeting is to determine the environmental issues and concerns to be analyzed for the base disposal and reuse in that area, to solicit comments on the proposed action and to solicit proposed disposal and reuse alternatives that should be addressed in the EIS for that base. In soliciting disposal and reuse inputs, the Air Force intends to consider all reasonable alternatives offered by any federal, state, or local government agency and any federally-sponsored or private entity or individual with an interest in acquiring available property at one of the listed closing bases. The

resulting environmental impacts will be considered in making disposal decisions to be documented in the Air Force's final disposal plan for each base.

To ensure the Air Force will have sufficient time to consider public inputs on issues to be included in the EISs, and disposal alternatives to be included in the final disposal plans, comments and reuse proposals should be forwarded to the address listed below by December 1, 1991. However, the Air Force will accept comments at the address below at any time during the environmental impact analysis process.

For further information concerning the study of these base disposal and reuse EIS activities, contact:

Lt. Colonel Tom Bartol
AFCEE/ESE
Norton AFB, California 92409-6448

Note: Comment date was extended from December 1, 1991 to January 2, 1992 after processing and publication of this Notice of Intent.

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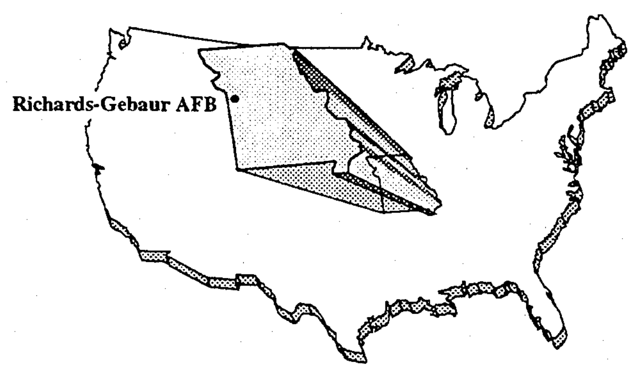

APPENDIX C

APPENDIX C

FINAL ENVIRONMENTAL IMPACT STATEMENT MAILING LIST

APPENDIX C

FINAL ENVIRONMENTAL IMPACT STATEMENT MAILING LIST

This list of recipients includes interested federal, state, and local agencies and individuals who have expressed an interest in receiving the document. This list also includes the governors of Missouri and Kansas, as well as United States senators and representatives and state legislators.

ELECTED OFFICIALS

Federal Officials

U.S. Senate

Honorable Christopher S. Bond

Honorable John C. Danforth

Honorable Robert Dole

Honorable Nancy Kassebaum

U.S. House of Representatives

Honorable Jan Meyers

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917 Support Group
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Regional Administrator, Region 7

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U.S. Department of Agriculture
Soil Conservation Service

U.S. Department of the Interior
Fish and Wildlife Service

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U.S. Marine Corps Support Center
Kansas City

U.S. Marine Corps
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U.S. Marine Corps
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Board of Aldermen
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Grandview Area Chamber of Commerce
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Grandview Industrial Development Authority
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Jackson County Economic Development Commission

Lee's Summit Chamber of Commerce
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Lee's Summit Economic Development Council
Executive Director

Lee's Summit Industrial Development Authority

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Executive President

Overland Park Chamber of Commerce
President

Raytown Area Chamber of Commerce
Executive Director

South Kansas City Chamber of Commerce (Missouri)
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Kristi Field

Heart of America Indian Center
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Ms. Linda Kendall
Cass County Public Library
Belton Branch

Ms. Karen Sullivan
Documents Department
The Libraries
Colorado State University

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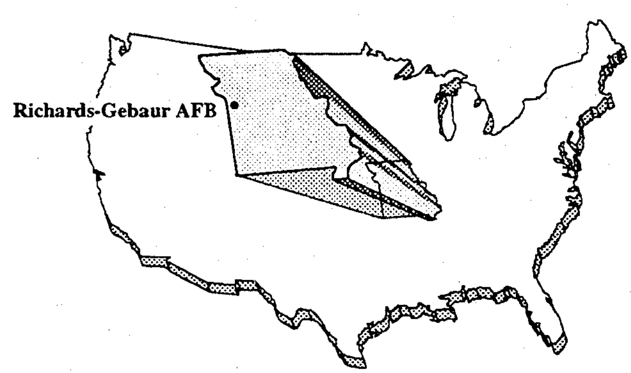

APPENDIX D

APPENDIX D

RICHARDS-GEBAUR AFB INSTALLATION RESTORATION PROGRAM BIBLIOGRAPHY

APPENDIX D

RICHARDS-GEBAUR AFB INSTALLATION RESTORATION PROGRAM BIBLIOGRAPHY

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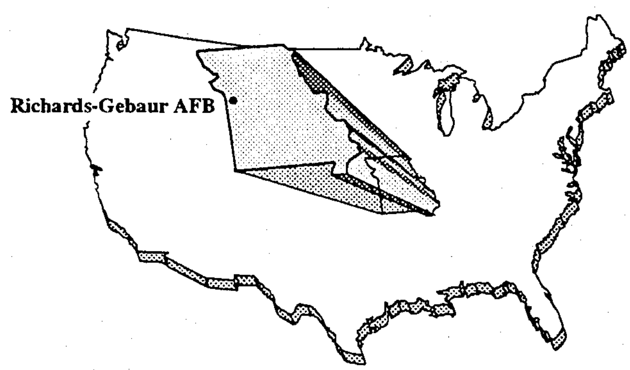

APPENDIX E

APPENDIX E

METHODS OF ANALYSIS

APPENDIX E

METHODS OF ANALYSIS

1.0 INTRODUCTION

This section describes the methods used in preparing this environmental impact statement (EIS). These methods were designed and implemented to evaluate the potential environmental impacts of disposal and reuse of Richards-Gebaur Air Force Base (AFB). Since future reuse of the site is uncertain in its scope, activities, and timing, the analysis considered several alternative reuse scenarios and evaluated their associated environmental impacts. The reuse scenarios analyzed in this EIS were defined for this study to span the anticipated range of reuse activities that are reasonably likely to occur due to disposal of the base. They were developed based on proposals put forth by affected local communities, interested individuals, and the Air Force, and considered general land use planning objectives.

The various analysis methods used to develop this EIS are summarized here by resource. Where appropriate, reference is made to another appendix that contains a more detailed methods discussion for a specific resource.

2.0 LOCAL COMMUNITY

2.1 COMMUNITY SETTING

The section on community setting was developed to provide the context within which other biophysical impacts could be assessed. Community setting impacts were based on projected direct and secondary employment and resulting population changes related to reuse of Richards-Gebaur AFB. These projections were used to quantify and evaluate changes in demand on community services, demand on transportation systems, air quality, and noise. A complete assessment of socioeconomic effects was conducted through a separate Socioeconomic Impact Analysis Study (SIAS) for the Disposal and Reuse of Richards-Gebaur AFB, which is the source for baseline and projected statistics used in this EIS.

The SIAS used information from sources including the U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics, U.S. Council of Economic Advisors, Mid-America Regional Council, Cass and Jackson counties, and the cities of Kansas City, Belton, and Grandview. The analysis used the Regional Interindustry Multiplier System model to generate demographic and economic projections associated with the reuse alternatives.

2.2 LAND USE AND AESTHETICS

Potential land use impacts were projected based on compatibility of land uses associated with the reuse alternatives with adjacent land uses and zoning; consistency with general plans and other land use plans, regulations, regional plans and policies; and effects of safety restrictions on land uses.

The region of influence (ROI) for the majority of direct land use impacts for this study consisted of Richards-Gebaur AFB, the cities of Belton and Kansas City adjacent to the base, and unincorporated areas in Cass County.

Maps, aerial photographs, and windshield surveys were used to characterize on- and off-base land uses. Applicable policies, regulations, and land use restrictions were identified from the land use plans and ordinances of municipalities in the ROI. The alternatives were compared to existing land use and zoning to identify areas of conflict, as well as to local planning goals and objectives as set forth in community comprehensive plans. Land uses were also examined for consistency with Federal Aviation Administration (FAA) regulations and recommended land uses in the vicinity of airfields.

For the aesthetics analysis, the affected environment was described based upon the visual sensitivity of areas within and visible from the base. These areas of high visual sensitivity were identified. The reuse alternatives were then evaluated to identify land uses to be developed, visual modifications that would occur, and new areas of visual sensitivity, and determine whether modification of unique or otherwise irreplaceable visual resources would occur and detract from the visual qualities or setting.

2.3 TRANSPORTATION

Roadways. Potential impacts to transportation due to the reuse alternatives for Richards-Gebaur AFB focus on key roads, local airport use, and rail service in the area, including segments of the transportation networks in the region that serve as linkages to the base. The need for improvements to on-base roads, off-base access, and regional arterials was considered. The analysis was derived using information from state and local government agencies, including the Missouri Highway and Transportation Department and the Mid-America Regional Council. Other data sources used for the roadway analysis include the Institute of Transportation Engineers and the Transportation Research Board. The ROI for the transportation analysis includes portions of Jackson County and Cass County with emphasis on the area surrounding Richards-Gebaur AFB.

The baseline traffic volumes for each of the study periods (1999, 2004, 2014) were estimated based on projections prepared by the Mid-America Regional Council's traffic forecasting model. Estimates of growth in

background traffic were added to the site-generated traffic to identify total future traffic volumes for each reuse alternative.

The number of daily vehicle trips expected as a result of specific land uses on the site was estimated for the years 1994, 1999, 2004, and 2014 on the basis of direct on-site jobs and other attributes of on-site land uses (such as the number of dwelling units, projected airport passenger volume, and commercial and industrial development). Trip Generation Data from the Institute of Transportation Engineers was used to determine vehicle trips. Daily vehicle trips were then allocated to the local and regional road network, using prior patterns and expected destinations, for each reuse option. Next, estimates of projected daily traffic without reuse of Richards-Gebaur AFB were developed. Finally, estimates of daily reuse related traffic were added to projections of daily baseline traffic to determine future Average Annual Daily Traffic (AADT) for each roadway segment for each reuse option.

The trip assignment analysis was based on the available entrance points to the site, as outlined for each reuse alternative. Access points include Andrews Road, 155th Street, and Westover Road. Major off-site routes that serve as access points to the site and that were assigned trips include Missouri Highway (M) 150, M-58, and United States Highway (US) 71. Traffic effects were determined based on LOS changes for each of the key roads. Intersections that could be expected to experience deficiencies are identified, although at the planning level of this analysis, in-depth evaluations of intersection capacities are not possible.

The transportation network in the ROI was then examined to identify potential impacts to Levels of Service (LOSs) arising from post-closure conditions and the direct and indirect effects of base reuse. Table E-1 shows the basic geometric and operating characteristics of key highways in the ROI. The planning applications from the Highway Capacity Manual were based on forecasts of peak hour volume (PHV) traffic and on assumed traffic, roadway, and control conditions. Therefore, once estimates of roadway capacity were prepared, estimates of PHV were completed for each segment using the following formula:

$$PHV = AADT \times K \times D;$$

where:

K - percent of traffic moving in both directions during the peak hour

Table E-1. Geometric and Operating Characteristics of Roadways in the Richards-Gebaur Area

Roadway	Segment	Highway Type	AADT	No. Lanes	Lane Width (feet)	Shldr Width (feet)	Speed Limit[d] (mph)	Design Speed (mph)
M-58	US 71 to N. Scott Avenue	Undivided	15,500[a]	2	11	0	25/45	50
M-150	Holmes Road to US 71	Undivided	8,590[b]	2	11	2-6	45/55	30/60
Andrews Road	M-150 to 155th Street	Undivided	1,480[c]	2	11	2[e]	25/35 /45	50
N. Scott Avenue	M-58 to Markey Road	Undivided	10,380[c]	2	11	3	35/45	50
155th Street	US 71 Interchange	Undivided	13,000[a]	2	11	0	45	50
Markey Road	N. Scott Avenue to Westover Road	Undivided	3,350[c]	2	16	2[e]	35	50
Westover Road	Markey Road to M-58	Undivided	1,730[c]	2	14	0	25/35	50
Highway Y	M-58 to US 71	Undivided w/turn	6,130[c]	2	12	8	55	60
US 71	Highway Y to 155 Street	Freeway	41,450[b]	4	12	4-6	55	70

Notes: (a) 1990 traffic count.
(b) 1992 traffic count.
(c) Developed from 1993 short counts.
(d) Lower speed in developed area.
(e) Curb and gutter.
AADT = average annual daily traffic.
M = Missouri Highway.
MPH = miles per hour.
US = United States Highway.

D - percent of traffic moving in the peak direction in the peak hour

PHV - peak hour traffic volume for the highway segment.

Ratios were then formed between PHV and capacity to determine LOS for each roadway segment. Comparison of these ratios provides a means to estimate changes in LOS ratings expected as a result of traffic volume associated with various reuse options.

Airspace. Airspace use in the vicinity of an airport is driven primarily by such factors as runway alignment, surrounding obstacles and terrain, air traffic control and navigational aid capabilities, proximity of other airports/ airspace uses in the area, and noise considerations. These same factors normally apply regardless of whether the airport is used for military or civil aircraft operations. For this reason, a preclosure reference was used in characterizing these factors related to airspace use at Richards-Gebaur AFB.

Historical data on military aircraft operations used to characterize airspace use at and around Richards-Gebaur AFB were obtained from the base and the Kansas City Aviation Department (KCAD). Airport owners/operators were contacted to obtain information on civil airport use, both historical and projected. Military and civil aviation forecasts were derived from KCAD projections of future demand.

The types and levels of aircraft operations projected for the reuse alternatives were evaluated and compared to the way airspace was configured and used under preclosure conditions. The capacity of the airport to accommodate the projected aircraft fleet and operations was assessed by calculating the airport service volume, using the criteria in the FAA Advisory Circular 150/5060-5. Potential effects on airspace use were assessed, based on the extent to which projected operations could (1) require modifications to the airspace structure or air traffic control systems and/or facilities; (2) restrict, limit, or otherwise delay other air traffic in the region; (3) encroach on other airspace areas and uses. It was recognized throughout the analysis process that a more in-depth study would be conducted by the FAA, once a reuse plan is selected, to identify any impacts of the reuse activities and what actions would be required to support the projected aircraft operations. Therefore, this analysis was used only to consider the level of operations that could be likely be accommodated under the existing airspace structure, and to identify potential impacts if operational capacities were exceeded.

2.4 UTILITIES

Utility usage was determined based on land uses and projected area population increases. The utility systems addressed in this analysis include

the facilities and infrastructure used for potable water (pumping, treatment, storage, and distribution), wastewater (collection and treatment), solid waste (collection and disposal), and energy generation and distribution (electricity and natural gas). Historic consumption data, service curtailment data, peak demand characteristics, storage and distribution capacities, and related information for base utilities (including projections of future utility demand for each utility provider's particular service area) were extracted from various base engineering reports. Information was also obtained from public and private utility purveyors and related county and city agencies.

The ROI for this analysis comprised the service area of the local purveyors of potable water, wastewater treatment, and energy that serve Richards-Gebaur AFB and the surrounding area. It was assumed that these local purveyors would provide services within the area of the existing base after disposal/reuse.

Potential impacts were evaluated based on long-term projections of demand and population obtained from the various utility purveyors within the region (through 2014) for each of their respective service areas. In each case, purveyors provided the most recent comprehensive projections that were either made prior to the base closure announcement or that did not take into account a change in demand from the base. These projections were then adjusted to reflect the decrease in demand associated with closure of Richards-Gebaur AFB and its subsequent operation under caretaker status. These adjusted forecasts were then considered the future baseline for comparison with potential reuse alternatives.

The potential effects of reuse alternatives were evaluated by estimating and comparing the additional direct and indirect demand associated with each alternative to the existing and projected operating capabilities of each utility system. Estimates of direct utility demands on site were used to identify the effects of the reuse activities on site-related utility systems. All changes to the utility purveyors' long-term forecasts were based on estimated project-related population changes in the region and the future rates of per capita demand explicitly indicated by each purveyor's projections or derived from those projections. It was assumed that the regional per capita demand rates were representative of the reuse activities, based on assumed similarities between proposed land uses and existing or projected uses in the region. Projections in the utilities analysis include direct demand associated with activities planned on base property, as well as resulting changes in domestic demand associated with population changes in the region.

3.0 HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT

Two categories of hazardous materials and hazardous waste management issues were addressed for this analysis: (1) impacts of hazardous materials utilized and hazardous wastes generated by each reuse proposal and

(2) residual impacts associated with past Air Force practices including delays due to Installation Restoration Program (IRP) site remediation. IRP sites were identified as part of the affected environment (Chapter 3), while remediation impacts associated with these sites were addressed as environmental consequences (Chapter 4). Impacts of wastes generated by each reuse proposal were also addressed in Chapter 4. Primary sources of data were existing published reports such as IRP documents, management plans for various toxic or hazardous substances (e.g., spill response, hazardous waste, asbestos), and survey results (e.g., radon). Pertinent federal, state, and local regulations and standards were reviewed for applicability to the reuse alternatives. Hazardous materials and waste management plans and inventories were obtained from Richards-Gebaur AFB. Interviews with personnel associated with these on-base agencies provided the information necessary to fill any data gaps. City and county agencies were also contacted regarding regulations which would apply to both current and post-closure activities for Richards-Gebaur AFB.

The ROI includes the current base property and all geographical areas that have been affected by an on-base release of a hazardous material or hazardous waste. All IRP sites are located within the base boundary.

Preclosure baseline conditions as defined for this study include current hazardous materials/waste management practices and inventories pertaining to the following areas: hazardous materials, hazardous waste, IRP sites, aboveground and underground storage tanks, asbestos, pesticides, polychlorinated biphenyls, radon, medical/biohazardous waste, ordnance, and lead. The impact analysis considered (1) the amount and type of hazardous materials/waste currently associated with specific facilities and/or areas proposed under each reuse alternative; (2) the regulatory requirements or restrictions associated with property transfer and reuse; (3) delays to development due to Installation Restoration Program (IRP) remediation activities; and (4) remediation schedules of specific hazardous materials/waste (e.g., IRP, asbestos) currently used by the Air Force.

4.0 NATURAL ENVIRONMENT

4.1 SOILS AND GEOLOGY

Evaluation of soils impacts addressed erosion potential, construction-related dust generation and other soils problems (low soil strength, expansive soils, etc.), and disturbance of unique soil types. Information was obtained from several federal, state, and local agencies. Assessment of potential impacts to geology from the reuse alternatives included evaluation of resource potential (especially aggregates), geologic hazards (particularly potential for seismicity, liquefaction, and subsidence), and flooding potential.

The soils analysis was based on a review of Soil Conservation Service (SCS) documents for soil properties. The soils in the ROI were then evaluated for erosion potential, permeability, evidence of hardpans, expansive soil characteristics, etc., as these relate to construction problems and erosion potential during construction. Mitigations were evaluated based on county ordinances and SCS recommendations. Common engineering practices were reviewed to determine poor soil characteristics and recommended mitigation measures.

The ROI for the geologic analysis included the region surrounding Richards-Gebaur AFB relative to seismic activity, aggregate resources, and flooding potential. The ROI for the soils analysis was limited to the base and specific areas designated for construction or renovation.

The geologic analysis was based on a review of existing literature for construction problems associated with geologic hazards, availability of construction aggregate, and whether reuse would impact the availability of known mineral resources.

4.2 WATER RESOURCES

Analysis of impacts of the reuse alternatives on water resources considered groundwater quality and quantity, surface water quality (effects from erosion or sedimentation and contamination), surface water drainage diversion, and non-point source surface runoff to the Blue and Little Blue Rivers. Impacts to water quality resources resulting from IRP activities were addressed under Hazardous Materials and Waste Management. Information was obtained from several federal, state, and local agencies. The ROI for water resources included the groundwater basin underlying the base, the surface drainage directly affected by runoff from the base, and the 100-year floodplain in the vicinity of the base.

Existing surface water conditions were evaluated for flood potential, non-point source discharge or transportation of contaminants, and surface water quality. Groundwater resources were evaluated as they pertained to adequate water supplies for each of the reuse alternatives. Groundwater quality and its potential use as a potable water source for each reuse alternative were documented. The existing storm water drainage system was evaluated based on available literature, and the impacts to this system from each of the reuse alternatives were determined.

4.3 AIR QUALITY

The air quality resource is defined as the condition of the atmosphere, expressed in terms of the concentrations of air pollutants occurring in an area as the result of emissions from natural and/or man-made sources. Reuse alternatives have the potential to affect air quality depending on net

changes in the release of both gaseous and particulate matter emissions. The impact significance of these emission changes was determined by comparing the resulting atmospheric concentrations to state and federal ambient air quality standards. This analysis drew from climatological data, air quality monitoring data, baseline emission inventory information, construction scheduling information, reuse-related source information, and transportation data. Principal sources of these data were the Missouri Department of Natural Resources, the Kansas City Air Quality Program, the Richards-Gebaur AFB environmental engineer, and the base civil engineer.

The ROI was determined by emissions from sources associated with construction and operation of the reuse alternatives. For inert pollutant emissions (all pollutants other than ozone and its precursors), the measurable ROI is limited to a few miles downwind from the source, (i.e., the immediate area of Richards-Gebaur AFB). The ROI for ozone impacts from project emissions included Jackson and Cass counties, Missouri.

Emissions predicted to result from the proposed alternatives were compared to existing baseline emissions to determine the potential for adverse air quality impact. Impacts were also assessed by modeling, where appropriate, and compared to air quality standards and attainment levels for complying with these standards. Appendix J contains the projected emissions inventory information and methods. Background concentrations were added to the project impacts for comparison with the standards and attainment levels. Impacts were considered significant if project emissions would (1) increase an off-site ambient pollutant concentration from below to above a federal, state, or local standard; (2) contribute a measurable amount to an existing or projected air quality standard exceedance; (3) expose sensitive receptors (such as schools or hospitals) to substantial pollutant concentrations. All other air quality impacts were considered insignificant.

4.4 NOISE

The noise analysis addressed potential noise impacts from reuse-generated aircraft operations, surface traffic, and other identified noise sources on communities surrounding Richards-Gebaur AFB. Most of the data were obtained from the aircraft operations and traffic data prepared for the reuse alternatives. Day-night average sound levels (DNL) were used to determine noise impacts. A single-event noise analysis using sound exposure levels (SEL) was also performed. Scientific literature on noise effects was also referenced.

The ROI for noise was defined as the area within DNL 65 decibels (dB) contours based on land use compatibility guidelines developed from FAA guidelines (FAA, 1989). The ROI for surface traffic noise impacts incorporated key road segments identified in the Transportation Analysis.

Noise levels from aircraft operations were estimated using the Air Force-developed and FAA-approved Noise Exposure Model, version 6.1. Noise contours for DNL 65 dB and above were depicted. Noise levels due to surface traffic were estimated using the Federal Highway Administration's (FHWA) Highway Noise Model (FHWA, 1978). Potential noise impacts were identified by overlaying the noise contours with land use and population information to determine the number of residents who would be exposed to DNL of 65 dB and above.

SEL related to reuse alternatives was provided for representative noise sensitive receptors exposed to aircraft noise from Richards-Gebaur Airport. SELs represent outdoor levels and take into account the location of the receptors relative to the various flight tracks and aircraft profiles used. Noise reduction effects for common construction were included in the sleep interference analysis; however, evaluation of sensitive receptors relative to noise reduction levels of specific structures was not performed.

Methods used to analyze noise impacts under each reuse scenario are presented in detail in Appendix I of this EIS.

4.5 BIOLOGICAL RESOURCES

Biological resources addressed in relation to disposal and reuse of Richards-Gebaur AFB included vegetation, wildlife, threatened and endangered species, and sensitive habitats (e.g., wetlands). Primary data sources for the analysis included published literature and reports, field reconnaissance of the base, and contacts with agencies such as the U.S. Fish and Wildlife Service, the Missouri Department of Conservation, and the Missouri Department of Natural Resources (MDNR). The ROI for the biological resources assessment comprised Richards-Gebaur AFB itself and other areas directly affected by reuse alternatives.

Vegetation and sensitive biological resources (e.g., wetlands and protected species) on the base were mapped using aerial photographs and field observations obtained during a reconnaissance survey of the base in April 1993. Wetlands on the base were delineated using the methods set forth in the U.S. Army Corps of Engineers Wetland Delineation Manual (1987). The resulting maps were entered into the computerized geographical information system (GIS).

The impact analysis was performed by overlaying project land use maps for each alternative onto the biological resource maps using the GIS to calculate the overlap by land use. The computer output (figures and tabular data) was then combined with percent development factors within the 20-year study period and type of development proposed (e.g., new construction or reuse of existing facilities) for each land use to estimate the amount of habitat that could be affected. The proportion of disturbance associated

with each land use category was determined based on accepted land use planning concepts. It was assumed that disturbance could occur at one or more sites within the land use polygon, unless designated as vacant land on the project maps. Disturbance of each habitat type present was considered to be in direct proportion to the development factor. These impacts were further divided into three development phases by visually comparing maps showing the proposed schedule of development with the resource maps. All other impacts were qualitatively assessed based on literature data and scientific expertise on the responses of plants and animals to project-related disturbances such as noise, landscaping, and vegetation maintenance.

4.6 CULTURAL RESOURCES

Cultural resources generally include three main categories: prehistoric resources, historic structures and resources, and traditional resources. For the purposes of this EIS, cultural resources were defined to also include paleontological resources, the fossil evidence of past plant and animal life. Prehistoric resources are places where human activity has measurably altered the earth or left deposits of physical remains. Historic structures and resources include standing structures and other physical remains of historic significance. Traditional resources are topographical areas, features, habitats, plants, animals, minerals, or archaeological sites that contemporary Native Americans or other groups value presently, or did so in the past, and consider essential for the persistence of their traditional culture. Cultural resources of particular concern include properties listed on the National Register of Historic Places (National Register), properties potentially eligible for the National Register, and sacred or ceremonial sites and areas.

Data used to compile information on these resources were obtained from existing environmental documents; material on file at Richards-Gebaur AFB; recent cultural resource reports pertaining to the base; interviews with individuals familiar with the history, archaeology, or paleontology of the Kansas City area; and records of the MDNR. The ROI for cultural resources includes all areas within the boundaries of Richards-Gebaur AFB.

The EIS contains the most up-to-date information on the importance of cultural resources on Richards-Gebaur AFB, based on recent and ongoing evaluation of eligibility for the National Register. Cultural resources for which eligibility information was unavailable were assumed to be eligible for the National Register, as is stipulated in the National Historic Preservation Act (NHPA).

According to National Register criteria (36 Code of Federal Regulations [CFR] 60.4), the quality of significance is present in districts, sites, buildings, structures, and objects that:

a) Are associated with events that have made a significant contribution to the broad patterns of history

b) Are associated with the lives of persons significant in the past

c) Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic value; or represent a significant and distinguishable entity whose components may lack individual distinction

d) Have yielded, or may be likely to yield, information important in prehistory or history.

To be listed in or considered eligible for listing in the National Register, a cultural resource must meet at least one of the above criteria and must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. Integrity is defined as the authenticity of a property's historic identity, as evidenced by the survival of physical characteristics that existed during the property's historic or prehistoric occupation or use. If a resource retains the physical characteristics it possessed in the past, it has the capacity to convey information about a culture or people, historical patterns, or architectural or engineering design and technology.

Compliance with requirements of cultural resource laws and regulations ideally involves four basic steps: (1) identification of significant cultural resources that could be affected by the reuse alternatives, (2) assessment of the impacts or effects of these actions, (3) determination of significance of potential historic properties within the ROI, and (4) development and implementation of measures to eliminate or reduce adverse impacts. The primary law governing cultural resources in terms of their treatment in an environmental analysis is the NHPA, which addresses the protection of archaeological, historic, and traditional resources. In compliance with the NHPA, the Air Force is in the process of consultation with the State Historic Preservation Officer, as required under Sections 106 and 110 of the Act.

Adverse effects that may occur as a result of base reuse are those that have a negative impact on characteristics that make a resource eligible for listing on the National Register. Actions that can diminish the integrity, research potential, or other important characteristics of an historic property include the following (36 CFR 800.9):

- Physical destruction, damage, or alteration of all or part of the property

- Isolating the property from its setting or altering the character of the property's setting when that character contributes to the property's qualification for the National Register

- Introduction of visual or auditory elements that are out of character with the property or that alter its setting

- Transfer or sale of a federally owned property without adequate conditions or restrictions regarding its preservation, maintenance, or use

- Neglect of a property, resulting in its deterioration or destruction.

Regulations for implementing Section 106 of the NHPA indicate that the transfer, conveyance, lease, or sale of an historic property are procedurally considered to be adverse effects, thereby ensuring full regulatory consideration in federal project planning and execution. However, effects of a project that would otherwise be found to be adverse may not be considered adverse if one of the following conditions exists:

- When the historic property is of value only for its potential contribution to archaeological, historical, or architectural research, and when such value can be substantially preserved through the conduct of appropriate research, and such research is conducted in accordance with applicable professional standards and guidelines

- When the undertaking is limited to the rehabilitation of buildings and structures and is conducted in a manner that preserves the historical and architectural value of the affected historic property through conformance with the Secretary's Standards for Rehabilitation and Guidelines for Rehabilitation of Historic Buildings

- When the undertaking is limited to the transfer, conveyance, lease, or sale of a historic property, and adequate restrictions or conditions are included to ensure preservation of the property's significant historic features.

The treatment of paleontological resources is governed by Public Law 74-292 (the National Natural Landmarks Program, implemented by 36 CFR 62). Only paleontological remains determined to be significant are subject to consideration and protection by a federal agency. Among the criteria used for National Natural Landmark designation are illustrative character, present condition, diversity, rarity, and value for science and education.

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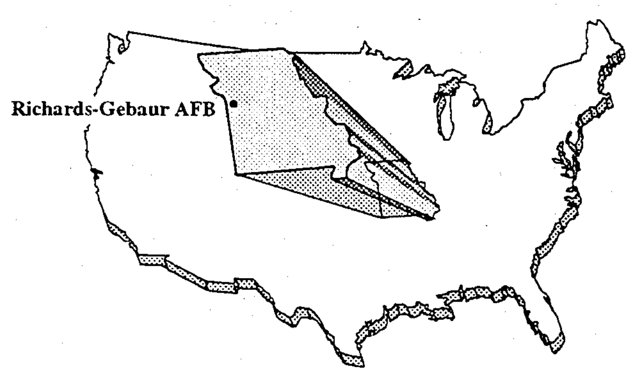

APPENDIX F

APPENDIX F

ENVIRONMENTAL PERMITS HELD BY RICHARDS-GEBAUR AFB

Table F-1. Environmental Permits Held by Richards-Gebaur AFB

Permit ID/ Facility ID	Original Date Issued	Issuing Agency	Comments/Conditions
M09571290015	1985	U.S. EPA	Hazardous Waste Generator Identification Number
04285	1985	MDNR	Hazardous Waste Generator Identification Number
PENDING	09/22/92	MDNR	Submitted application for NPDES permit for storm water discharges to Scope Creek
UT0002340	03/10/89	MDNR	13 underground storage tanks registered
UT0002340	07/14/93	MDNR	Submitted application to register 13 additional underground storage tanks

EPA = Environmental Protection Agency.
MDNR = Missouri Department of Natural Resources.
NPDES = National Pollutant Discharge Elimination System.

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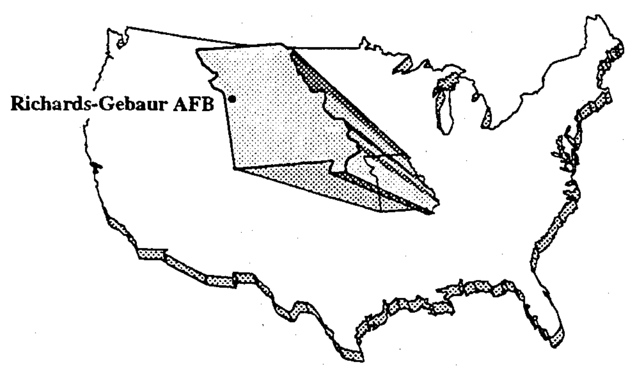

APPENDIX G

APPENDIX G

AIR FORCE POLICY
FOR MANAGEMENT OF ASBESTOS-CONTAINING
MATERIAL (ACM) AT CLOSURE BASES

APPENDIX G

AIR FORCE POLICY
FOR MANAGEMENT OF ASBESTOS-CONTAINING MATERIAL (ACM) AT CLOSURE BASES

This policy applies specifically to property being disposed of through the Base Realignment and Closure (BRAC) process and supersedes all previous policy on this matter.

1. REFERENCES

a. Asbestos Hazard Emergency Response Act (AHERA).

b. Federal Tort Claims Act, 28 U.S.C. §2671.

c. 40 CFR Part 61, Subpart M - National Emission Standards for Hazardous Air Pollutants (NESHAP).

d. 29 CFR Section 1910.1001 - Occupational Safety and Health Administration (OSHA) general industry standard for asbestos.

e. 29 CFR Section 1926.58 - Occupational Safety and Health Administration (OSHA) construction industry standard for asbestos.

f. 40 CFR Part 302 - Designation, Reportable Quantities, and Notification.

g. 41 CFR Section 101-47.304-13 - Federal Property Management Regulations provisions relating to asbestos.

h. AFI 32-1052, Facility Asbestos Management.

i. AFI 32-7066, Environmental Baseline Surveys in Real Estate Transactions.

2. DEFINITIONS

a. **Asbestos** - A group of naturally occurring minerals that separate into fibers, including chrysotile, amosite, crocidolite, asbestiform anthophyllite, asbestiform tremolite, and asbestiform actinolite.

b. **ACM** - Asbestos-containing Material. Any material containing more than one percent asbestos.

c. **Accredited Asbestos Professional** - Air Force Bioenvironmental Engineer or any other professional who is accredited through EPA's asbestos model accreditation plan or other equivalent method.

3. POLICY

The Air Force will ensure that at the time any property is conveyed, leased, or otherwise disposed of through the Base Realignment and Closure (BRAC) process, it does not pose a

threat to human health due to ACM and that the property complies with all applicable statutes and regulations regarding ACM.

a. **Responsibilities**

(1) The Air Force Base Conversion Agency (AFBCA) conducts and funds, from BRAC accounts, any asbestos surveys and remediation needed solely for base closure; to include, but not limited to, additional asbestos surveys for environmental baseline surveys, asbestos repair or resurvey of vacated buildings.

(2) The MAJCOM's conduct and fund asbestos surveys and remediation needed to properly manage asbestos hazards, in accordance with current policy guidelines, up to the time of property management responsibility transfer to AFBCA.

b. **Surveys for ACM.** A survey of facilities for ACM will be accomplished or updated within the 6 months prior to the initial transfer, whether by lease, sale or other disposal method. Surveys will, at a minimum, identify the extent of asbestos contained in facilities and the exposure hazards. Surveys will be accomplished under the supervision of an accredited asbestos professional. These surveys will minimally include the following:

(1) A review of facility records.

(2) A visual inspection.

(3) An intrusive inspection, as directed by an accredited asbestos professional.

(4) Ambient air sampling, if directed by an accredited asbestos professional, in order to determine if any appropriate remedial actions are needed prior to the property being leased or transferred, or to protect facility occupants.

c. **Remediation of ACM.** Remediation of ACM in facilities at closure bases will be in accordance with applicable laws, regulations and standards. Remediation of ACM may be required if, in the judgment of an accredited asbestos professional, at least one of the following criteria apply:

(1) The ACM is of a type, condition, and in a location such that, through normal and expected use of the facility, it will be damaged to the extent that it will produce an asbestos fiber hazard to facility occupants.

(2) The type and condition of the ACM is such that it is not in compliance with appropriate statutes or regulations.

EXCEPTION: Remediation of ACM by AFBCA will not be accomplished if the transferee is willing to conduct remediation in accordance with applicable standards prior to beneficial occupancy as part of the transfer agreement.

d. **Full Disclosure.** AFBCA will make a full disclosure to the extent known of the types, quantities, locations, and condition of ACM in any real property to be conveyed, leased, sold, or otherwise transferred. Results of ambient air sampling will also be disclosed where available. This disclosure will normally be included in appraisal instructions, invitations for bids or offers to purchase, advertisements and contracts for sale, leases, and deeds.

e. **Management of ACM.** ACM remaining in a facility will be managed in-place using commonly accepted standards, criteria, and procedures in compliance with all applicable laws and regulations to assure the protection of human health and the environment. The responsibility for this management will be transferred to the owner or lessee by execution of the appropriate documents.

4. EFFECTIVE DATE

This policy becomes effective on the date signed and remains in effect until superseded.

/s/
Alan P. Babbitt
Acting Deputy Assistant Secretary of the Air Force
(Environment, Safety, and Occupational Health)

3/25/94
Date

This Air Force Policy for Management of Asbestos Containing Material (ACM) at Closure Bases, March 25, 1994, supersedes previous Air Force Policy on management of asbestos dated November 6, 1990, and May 1, 1992, respectively, and has been retyped for purposes of clarity and legibility.

Table G-1. Facilities Surveyed for Asbestos
Page 1 of 2

Facility (Use)	Asbestos-Containing Material (ACM) Present
000 (Steam Piping System)	All negative samples
105 (Communications Facility)	Joint insulation
243 (Dormitory)	ACM found but not described in report
245 (Swimming Pool Water Treatment)	No suspected material found
247 (Swimmers' Bath House)	Tank and pipe insulation
248 (Open Mess)	Tank, pipe, and joint insulation
250 (Dormitory)	Mechanical insulation
252 (Dormitory)	Mechanical insulation
602 (Flight Simulator Training)	Pipe and joint insulation
603 (Air Force Clinic)	Tank, pipe, and joint insulation
604 (Air Force Clinic)	Tank, pipe, and joint insulation
605 (Maintenance Shop)	Pipe and joint insulation
606 (Base Engineering Administration)	Pipe, tank, and joint insulation, transite shingles
607 (Base Engineering Administration)	All negative samples
610 (Supply/Equipment Base Warehouse)	Pipe and joint insulation
614 (Administration Office)	All negative samples
617 (Disaster Preparedness)	Joint insulation
619 (Exchange Branch)	Mechanical insulation, ceiling panels
620 (Document Storage Facility)	All negative samples
621 (Acid Storage)	No suspected material found
702 (Vehicle Fuel Station)	No suspected material found
703 (Vehicle Operations Administration)	Pipe and joint insulation
704 (Vehicle Maintenance Shop)	Pipe and joint insulation
709 (Reserve Forces Aeromedical Evacuation Training)	All negative samples
710 (Reserve Forces Operational Training)	Tank, pipe, and joint insulation
711 (Refuel Vehicles Shop)	Pipe and joint insulation
757 (Sanitary Latrine)	No suspected material found
801 (Survival Equipment Shop)	Pipe and joint insulation, transite shingles
828 (Warehouse and Shop)	Tank, pipe, and joint insulation
839 (Non-Destructive Inspection Laboratory)	Joint insulation
841 (Fixed Tactical Air Navigational Station)	All negative samples
845 (Electrical Power Station)	No suspected material found
900 (Fire Station)	Pipe and joint insulation
901 (Base Operations)	Pipe and duct insulation
903 (Electrical Power Station)	No suspected material found
904 (Base Hazardous Storage)	No suspected material found
918 (Maintenance Hangar)	Tank, pipe, and joint insulation
920 (Vehicle Service Rack)	No suspected material found

Table G-1. Facilities Surveyed for Asbestos
Page 2 of 2

Facility (Use)	Asbestos-Containing Material (ACM) Present
923 (Storage Shed)	No suspected material found
924 (Maintenance/Storage)	No suspected material found
925 (Reserve Forces Training)	Joint insulation
926 (Headquarters/Office)	Joint insulation
927 (Engine and Pneudraulics Shop)	Joint insulation
930 (Electronic Counter Measures Pad Shop/Storage)	Mechanical, joint, and duct insulation, lay-in ceiling
931 (Liquid Oxygen Storage)	No suspected material found
936 (Non-Air Force Administration Office)	No suspected material found
937 (Base Hazardous Storage)	No suspected material found
940 (Aircraft General Purpose Shop)	Tank, pipe, and joint insulation
942 (Heating Facility)	Boiler, tank, pipe and joint insulation
946 (Base Hazardous Storage)	No suspected material found
947 (Corrosion Control Storage)	No suspected material found
948 (Maintenance Dock Fuel System)	Boiler and joint insulation
949 (Corrosion Control Storage)	No suspected material found
951 (Maintenance Shop)	Boiler, tank, pipe, and joint insulation
953 (Liquid Fuel Pump Station)	No suspected material found
958 (Ground Support Shop)	Joint insulation
962 (Ground Equipment Shop)	No suspected material found
965 (Aircraft General Purpose Shop)	Boiler, tank, and joint insulation
966 (Maintenance Dock)	Tank and joint insulation
1011 (Electrical Power Station)	No suspected material found
1025 (Air Traffic Transceivers)	Pipe and joint insulation
1049 (Range Control House)	All negative samples
1050 (Aboveground Magazine Storage)	No suspected material found
1100 (Mobile Radio Transceiver)	Pipe and joint insulation
1201 (Office)	Duct and joint insulation
1202 (Missile Assembly and Training)	Mechanical insulation
1203 (Aboveground Magazine Storage)	No suspected material found
1205 (Base Hazardous Storage)	No suspected material found
1401 (Instrument Landing System Localizer)	No suspected material found
1800 (Instrument Landing System Marker Beacon)	No suspected material found
1900 (Instrument Landing System Marker Beacon)	No suspected material found

Source: Hall-Kimbrell, 1987.

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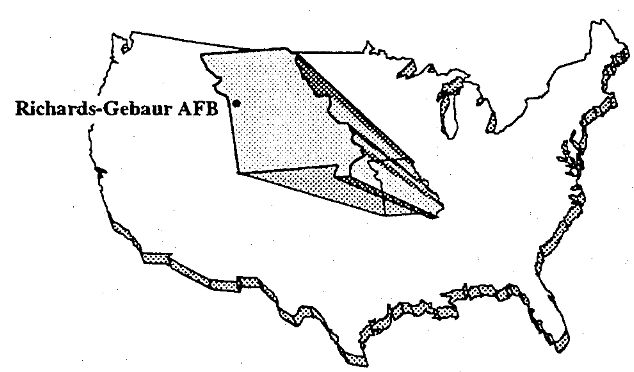


APPENDIX H

APPENDIX H

PLANT AND ANIMAL SPECIES OCCURRING ON OR NEAR RICHARDS-GEBAUR AFB

Plant and Animal Species Occurring on or near Richards-Gebaur AFB
Page 1 of 4

Common Name	Scientific Name
Vegetation	
Grasses, Herbs, and Shrubs	
Tooth cup	*Ammannia coccinea*
Poor-man's weatherglass	*Anagallis arvensis*
Big blue-stem	*Andropogon gerardi* var. *gerardi*
Little blue-stem	*Andropogon scoparius*
Prairie anemone	*Anemone caroliniana*
Blue daisy	*Aster paludosus*
Wintercress	*Barbarea vulgaris*
Spanish needles	*Bidens bipinnata*
Beggar's ticks	*Bidens polylepis*
Rattlesnake fern	*Botrychium virginianum*
Tall sedge	*Carex bicknellii*
Woodland sedge	*Carex blanda*
Sedge	*Carex projecta*
Sedge	*Carex tribuloides*
Common chicory	*Cichorium intybus*
Field thistle	*Circium discolor*
Clammy cuphea	*Cuphea petiolata*
Spike rush	*Eleocharis obtusa* var. *obtusa*
Six-weeks fescue	*Festuca octoflora* var. *tenella*
Broom snakeroot	*Gutierrezia dracunculoides*
Prairie sunflower	*Helianthus salicifolius*
Pale snapweed	*Impatiens pallida*
Path rush	*Juncus kansanus*
Tall knotted rush	*Juncus Torreyi*
Prairie blazing star	*Liatris pychnostachya*
White sweetclover	*Melilotus albus*
Yellow sweetclover	*Melitotus officinalis*
Horsemint	*Mentha longifolia*
Oxalis	*Oxalis* sp.
Hairy panic grass	*Panicum capillare* var. *capillare*
Crooked panic grass	*Panicum dichotamiflorum*
Canada bluegrass	*Poa compressa*
Kentucky blue-grass	*Poa pratensis*
Prostrate knotweed	*Polygonum aviculare*
Marsh knotweed	*Polygonum coccineum*
Smooth sumac	*Rhus glabra* var. *glabra*

Plant and Animal Species Occurring on or near Richards-Gebaur AFB
Page 2 of 4

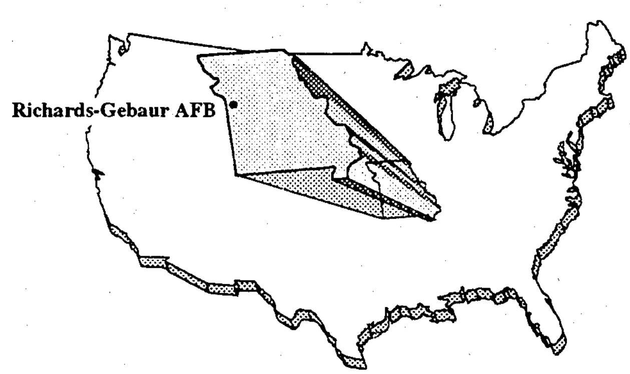
Common Name	Scientific Name
Missouri gooseberry	*Ribes missouriense*
Curly dock	*Rumex crispus*
Prairie rosegentian	*Sabatia campestris*
Engleman arrow-head	*Sagittaria Englemanniana* subsp. *brevirostra*
Blue sage	*Salvia azurea* var. *grandiflora*
Common tumble grass	*Schedonnardus paniculatus*
Prairie blue-eyed grass	*Sisyrinchium campestre* var. *campestre*
Yellow Indian grass	*Sorghastrum nutans*
Sudan grass	*Sorghum sudanense*
Bur-reed	*Sparganium androcladum*
Prairie cord grass	*Spartina pectinata*
Tall redtop	*Tridens flavus*
Common cattail	*Typha latifolia*
Dwarf nettle	*Urtica urens*
Trees	
Sugar maple	*Acer saccharum*
Honey locust	*Gleditsia triacanthos*
Black walnut	*Juglans nigra*
Osage orange	*Maclura pomifera*
Blue spruce	*Picea pungens*
Eastern cottonwood	*Populus deltoides*
Pin oak	*Quercus palustris*
Black oak	*Quercus velutina*
Carolina willow	*Salix caroliniana*
Prairie willow	*Salix humilis* var. *hyporhysa*
Black willow	*Salix nigra*
American elm	*Ulmus americana*
Wildlife	
Mammals	
Coyote	*Canis latrans*
Least shrew	*Cryptotis parva*
Opossum	*Didelphis virginiana*
Big brown bat	*Eptesicus fuscus*
Plains pocket gopher	*Geomys bursarius*
Silver-haired bat	*Lasionycteris noctivagans*
Red bat	*Lasiurus borealis*
Hoary bat	*Lasiurus cinereus*
Black-tailed jackrabbit	*Lepus californicus*

Plant and Animal Species Occurring on or near Richards-Gebaur AFB

Common Name	Scientific Name
Woodchuck	*Marmota monax*
Striped skunk	*Mephitis mephitis*
Prairie vole	*Microtus ochrogaster*
House mouse	*Mus musculus*
Keen's bat	*Myotis keenii*
Little brown bat	*Myotis lucifugus*
Evening bat	*Nycticeius humeralis*
White-tailed deer	*Odocoileus virginianus*
White-footed mouse	*Peromyscus leucopus*
Deer mouse	*Peromyscus maniculatus*
Eastern pipistrel	*Pipistrellus subflavus*
Raccoon	*Procyon lotor*
Norway rat	*Rattus norvegicus*
Western harvest mouse	*Reithrodontomys megalotis*
Eastern mole	*Scalopus aquaticus*
Eastern gray squirrel	*Sciurus carolinensis*
Fox squirrel	*Sciurus niger*
Eastern cottontail	*Sylvilagus floridanus*
American badger	*Taxidea taxus*
Gray fox	*Urocyon cinereoargenteus*
Red fox	*Vulpes vulpes*
Birds	
Red-winged blackbird	*Agelaius phoenicius*
Canada goose	*Branta canadensis*
Great-horned owl	*Bubo virginianus*
Northern cardinal	*Cardinalis cardinalis*
House finch	*Carpodacus mexicanus*
Killdeer	*Charadrius vociferus*
Northern flicker	*Colaptes aura*
Northern bobwhite	*Colinus virginianus*
Yellow-rumped warbler	*Dendroica coronata*
Black-capped chickadee	*Parus atricapillus*
Tufted titmouse	*Parus bicolor*
Downy woodpecker	*Picoides pubescens*
Common grackle	*Quiscalus quiscula*
Eastern phoebe	*Sayornis phoebe*
American tree sparrow	*Spizella arborea*
Eastern meadowlark	*Sturnella magna*

Plant and Animal Species Occurring on or near Richards-Gebaur AFB
Page 4 of 4

Common Name	Scientific Name
European starling	*Sturnus vulgaris*
Brown thrasher	*Toxostoma rufum*
American robin	*Turdus migratorius*
Greater prairie chicken	*Tympanuchus cupido*
Mourning dove	*Zenaida macroura*
Amphibians and Reptiles	
Small-mouthed salamander	*Ambystoma texanum*
American toad	*Bufo americanus charlesmithi*
Great Plains toad	*Bufo cognatus*
Western worm snake	*Carphophis amoenus*
Prairie lined racerunner	*Cnemidophorus sexlineatus*
Eastern yellow-bellied racer	*Coluber constrictor flaviventris*
Prairie ringneck snake	*Diadophis punctatus arnyi*
Eastern hognose snake	*Heterodon platyrhinos*
Cope's gray treefrog	*Hyla chrysoscelis*
Common gray treefrog	*Hyla versicolor*
Prairie kingsnake	*Lampropeltis calligaster calligaster*
Speckled kingsnake	*Lampropeltis getulus holbrooki*
Mudpuppy	*Necturus maculosus maculosus*
Blotched plain-bellied water snake	*Nerodia erythrogaster transversa*
Diamondback water snake	*Nerodia rhombifera rhombifera*
Northern water snake	*Nerodia sipedon sipedon*
Bullfrog	*Rana catesbiana*
Southern leopard frog	*Rana sphenocephala*
Ornate box turtle	*Terrapene ornata ornata*
Western ribbon snake	*Thamnophis proximus proximus*
Red-sided garter snake	*Thamnophis sirtalis parietalis*
Central lined snake	*Tropidoclonion lineatum annectens*
Invertebrates	
Crayfish	*Cambarus* sp.
Crayfish	*Orchinectes* sp.



APPENDIX I

APPENDIX I

NOISE

APPENDIX I

NOISE

1. DESCRIPTION OF ALTERNATIVES

1.1 PRECLOSURE

Typical noise sources on and around airfields usually include aircraft, surface traffic, and other human activities.

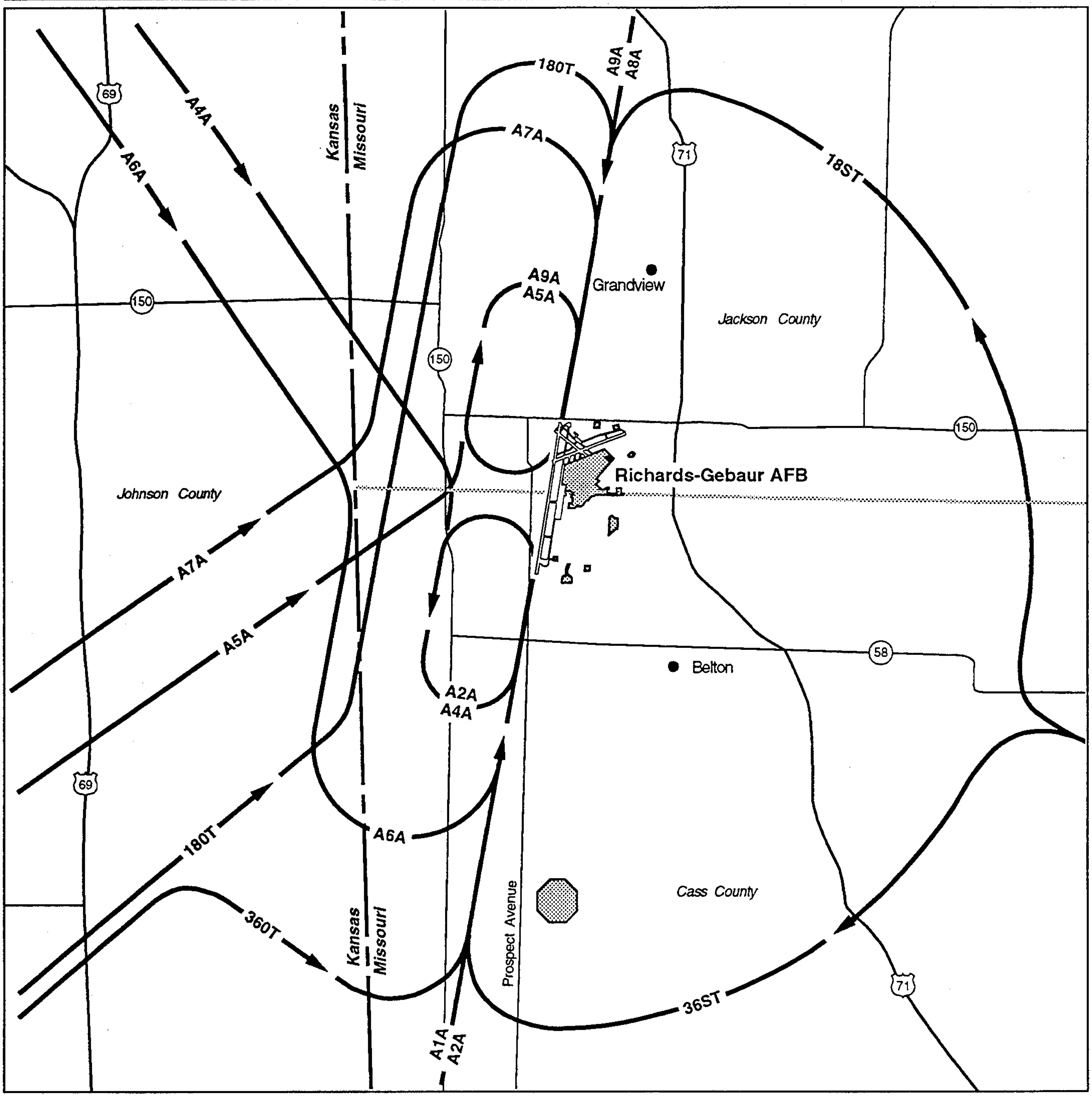
Military aircraft operations are the primary source of noise in the vicinity of Richards-Gebaur Air Force Base (AFB). The contours for preclosure operations are shown in Figure 3.4-4 of this Environmental Impact Statement (EIS). In airport analyses, areas exposed to a day-night average sound level (DNL) of 65 decibels (dB) and above are considered in land use compatibility planning and impact assessment; therefore, these areas were of particular interest.

The fleet mix and annual aircraft operations modeled for preclosure are presented in Table I-1. The aircraft types and corresponding operations shown in Tables I-1 and 3.2-4 were derived from aircraft logs taken by Richards-Gebaur AFB personnel. Both tables are condensed from these logs using different grouping criteria. For modeling purposes, aircraft with similar noise signatures have been grouped together under representative aircraft types to provide an accurate model of the aircraft noise environment. Total operations are the same in both tables. Flight tracks modeled are presented in Figures I-1 through I-4. Civilian arrival tracks are the same as the military tracks A1A through A9A. The day/night split for all aircraft operations is shown in Table I-2. Stage lengths for aircraft operations are given in Table I-3. Engine runup operations were assumed to occur at the locations presented in Figure I-5. The number of runup operations are presented in Table I-4. During typical runup operations, the engines would run for 25 minutes at idle power and 5 minutes at departure power. It was assumed that there would be one test cell available (location is identified in Figure I-5). The aircraft were assumed to have a heading of 270 degrees for all run-up locations. Daily operations assigned to each flight track are provided in Table I-5. Aircraft with less than 0.01 daily operation per flight track were not included in the modeling. Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

The surface traffic noise levels in the vicinity of the base were established in terms of DNL by modeling the arterial roadways near the base using current traffic and speed characteristics. Annual average daily traffic (AADT) data, traffic mix, road width, speed and day/night split were developed in the traffic engineering study presented in Section 3.2.3, Transportation, and

Table I-1. Annual Aircraft Operations for Preclosure

Type of Aircraft	Number of Operations	Percent of Category	Total of Category	Category Percent of Total
Military			8,336	23
A-10	4,778	57		
C-130	648	8		
T-37	585	7		
T-38	887	11		
UH-1N	322	4		
F-16	189	2		
F-18	50	<1		
KC-10	308	4		
C-9	141	2		
P-3	186	2		
T-34	37	<1		
T-44	26	<1		
C-12	127	2		
C-21	52	<1		
General Aviation			28,679	77
Single Engine Piston, Fixed Pitch	15,653	55		
Single Engine Piston, Variable Pitch	8,379	29		
Beech Baron 58P	1,788	6		
Conquest II	1,891	7		
Learjet 35	300	1		
Citation I	243	<1		
DC-9	192	<1		
B-212 (helicopter)	233	<1		
TOTAL			37,015	100



EXPLANATION

A1A Flight Paths for Richards-Gebaur AFB

71 U.S. Highway

58 State Highway

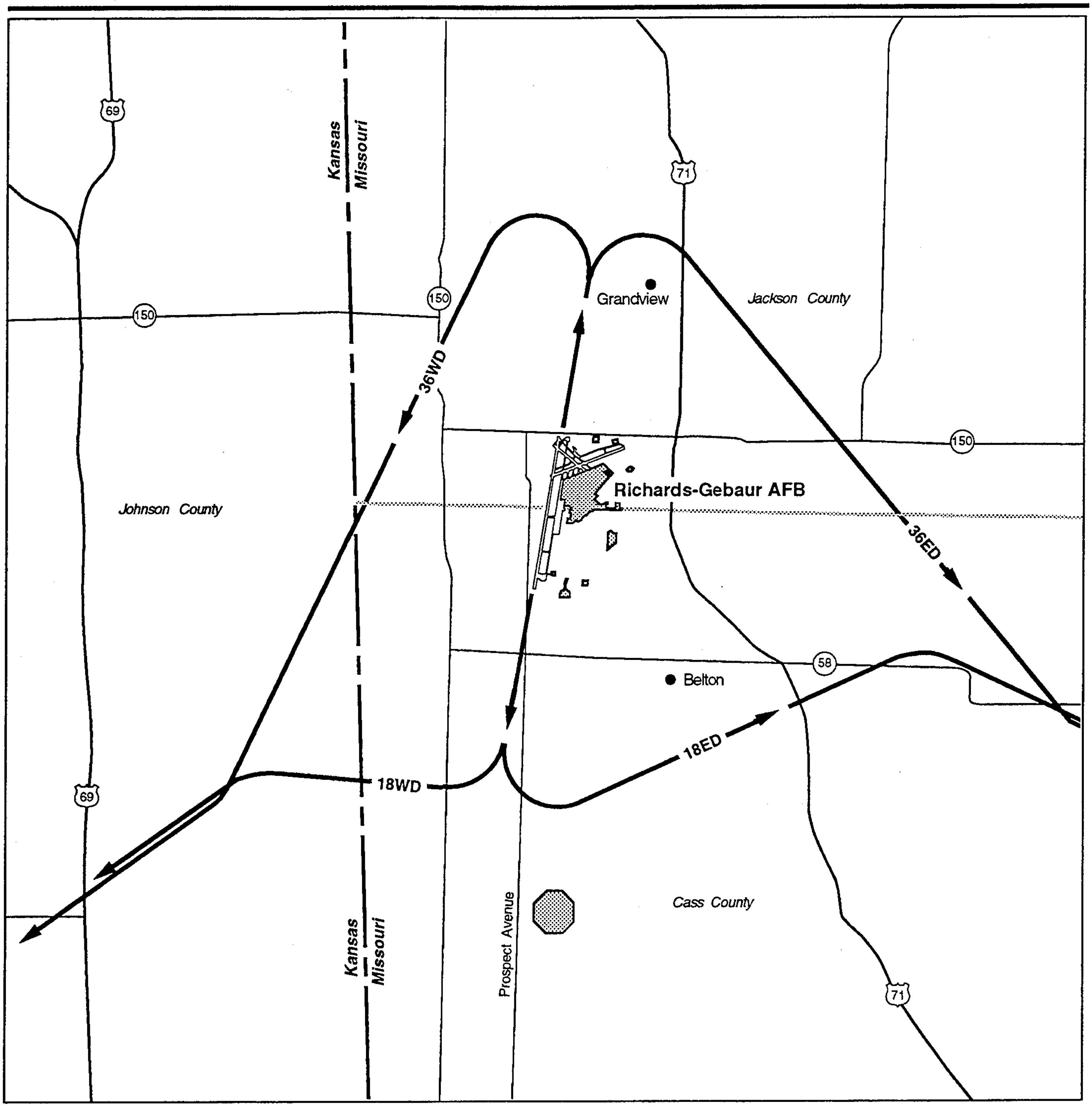
County Line

State Boundary

0 1/2 1 2 Miles

Military Arrival Tracks - All Alternatives

Figure I-1



EXPLANATION

18WD → Flight Paths for Richards-Gebaur AFB

71 U.S. Highway

58 State Highway

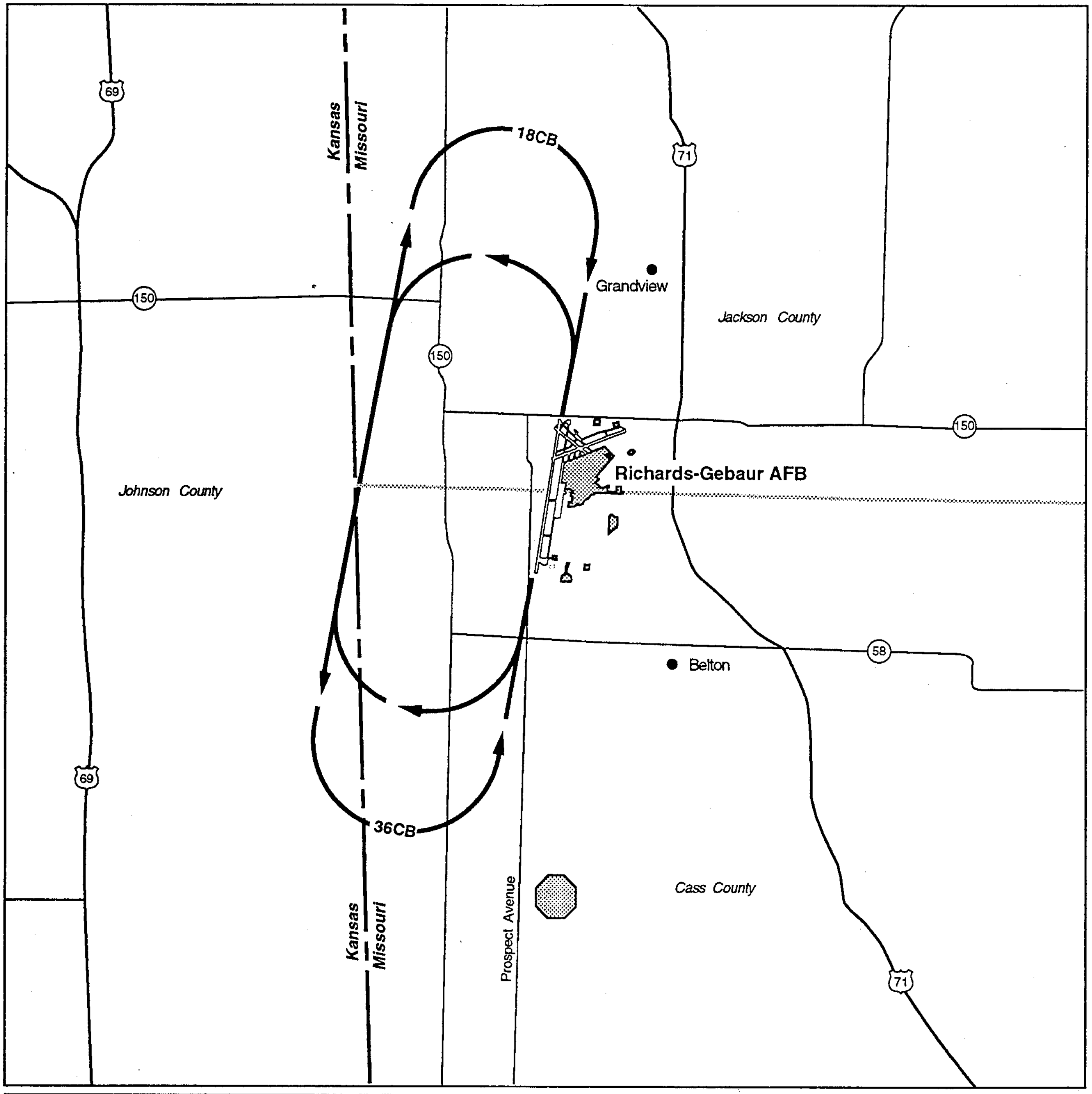
County Line

State Boundary

0 1/2 1 2 Miles

Military Departure Tracks - All Alternatives

Figure I-2



EXPLANATION

36CB — Flight Paths for Richards-Gebaur AFB

71 — U.S. Highway

58 — State Highway

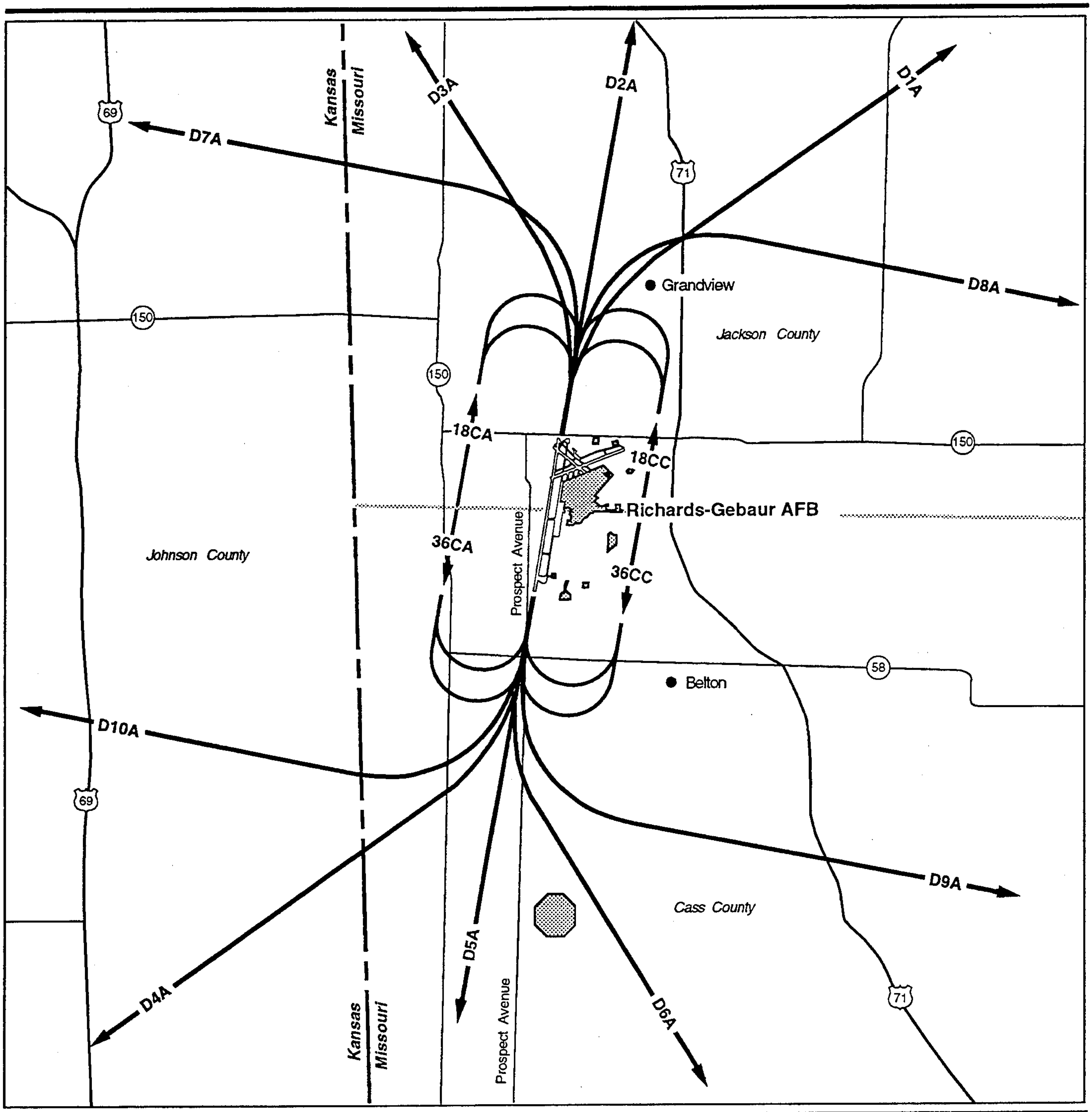
County Line

State Boundary

0 1/2 1 2 Miles

Military Closed Pattern Tracks - All Alternatives

Figure I-3



EXPLANATION

36CA — Flight Paths for Richards-Gebaur Airport

71 — U.S. Highway

58 — State Highway

County Line

State Boundary

0 1/2 1 2 Miles

Civilian Departure and Touch and Go Tracks for Preclosure and Closure

Figure I-4

Table I-2. Day-Night Split of Aircraft Operations for Preclosure, Closure, and Alternatives

Aircraft Type	Percent Daytime	Percent Nighttime
Preclosure		
Military	100	0
General Aviation	98	2
Closure		
Military	100	0
General Aviation	98	2
Proposed Action and Aviation Alternative		
Military	100	0
General Aviation	98	2
Commuter	100	0
Air Cargo	50	50
Aircraft Maintenance	100	0
Pilot Training	100	0
Aviation with Mixed Use Alternative		
Military	100	0
General Aviation	98	2
Flight Training	100	0
Industrial Alternative		
Military	100	0
General Aviation	98	2

Note: Percentages are approximate for each category. Different aircraft within each category may have different day-night splits. For actual number of operations of each aircraft for each time period refer to the "Assignment of Operations" table for the alternatives presented in this Appendix.

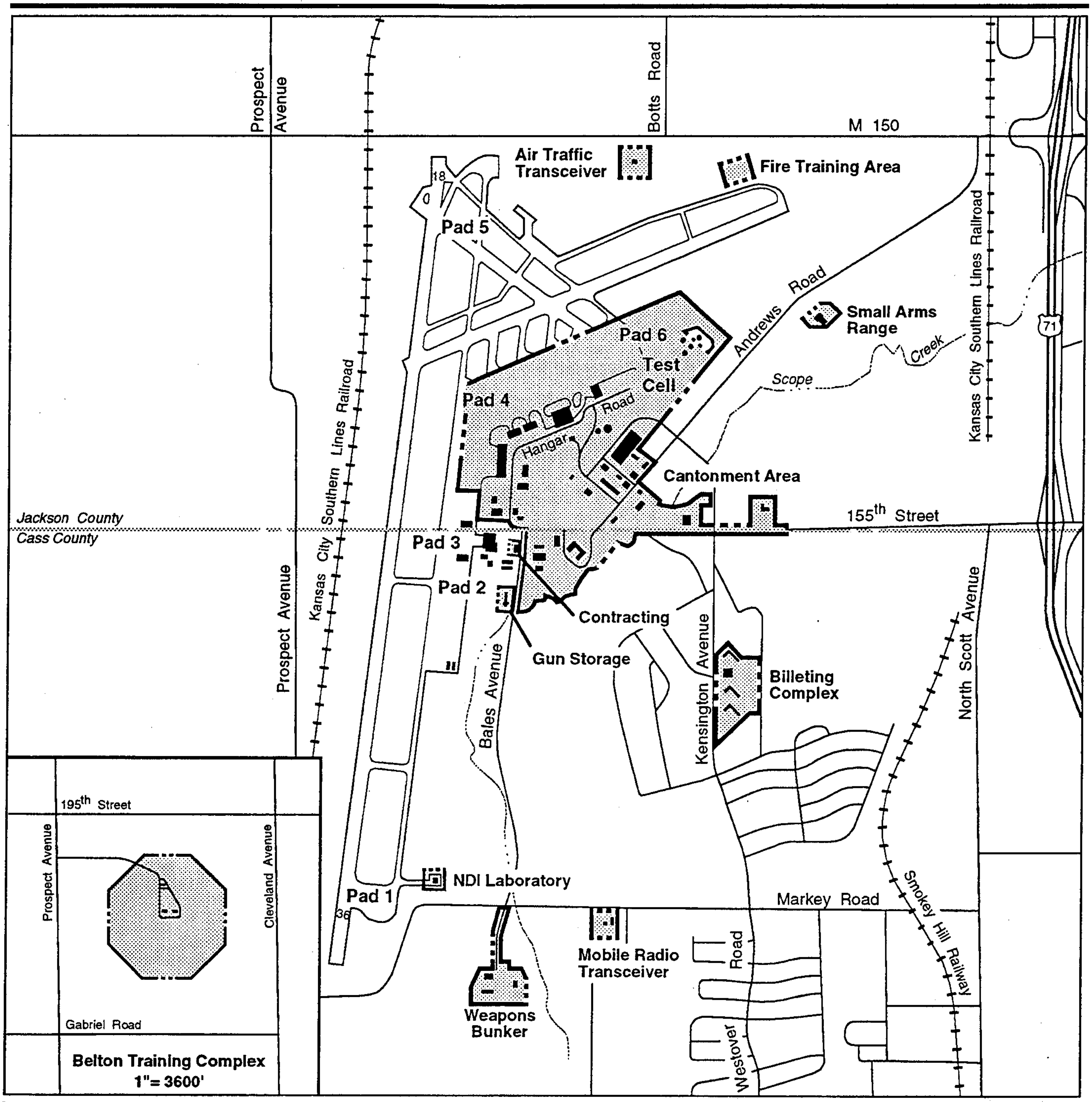
Table I-3. Stage Lengths Assumed for Civilian Aircraft Operations

Group	Stage Length[a]
General Aviation	1
Commuter	1
Air Cargo	1
Aircraft Maintenance	
50% of All Operations	1
50% of All Operations	2
Flight Training	1

Notes: Military aircraft do not have FAA-defined stage lengths.

(a) Stage length may affect operational parameters such as takeoff or landing profiles, engine thrust settings, and aircraft speed of some aircraft; these parameters may, in turn, affect aircraft noise exposure. Stage lengths correspond to the distance flown in increments of 500 miles (e.g., stage length 1 corresponds to flights between 1 and 500 miles; 2 corresponds to flights between 500 and 1,000 miles, etc.). The maximum stage length used in modeling is 7 (>4,500 miles).

FAA = Federal Aviation Administration.



EXPLANATION

Base Boundary

Base Property

Runup Pad Locations

0 500 1000 2000 Feet

Figure I-5

Table I-4. Number of Daily Engine Runup Operations for Preclosure, Closure, Proposed Action, and the Aviation Alternative

Alternative	1992	1994	1999	2004	2014
Preclosure					
A-10	0.42				
Cessna 150	0.57				
Closure					
Dash 7		0.68			
Cessna 150		0.57			
Proposed Action					
Dash 7			2.05	3.42	5.48
L-1011			-	0.16	0.41
B-727-200 Retrofit			0.16	0.25	0.41
Aviation Alternative					
Dash 7			0.71	1.42	2.14
L-1011			0.04	0.08	0.12
MD-80			0.12	0.25	0.37
B-727-200 Retrofit			0.25	0.49	0.74

Table I-5a. Assignment of Operations for Preclosure (1992)

Aircraft	D1A Day	D1A Night	D2A Day	D2A Night	D3A Day	D3A Night	D4A Day	D4A Night	D5A Day	D5A Night	D6A Day	D6A Night	D7A Day	D7A Night
	Departure Flight Tracks													
A-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-130	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-37	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-38	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UH-1N	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KC-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-44	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sgl. Eng. Piston, Fixed Pitch	1.07	0.02	0.15	-	1.07	0.02	0.59	0.01	0.59	0.01	0.59	0.01	1.07	0.02
Sgl. Eng. Piston, Variable Pitch	0.57	0.01	0.08	-	0.57	0.01	0.31	0.01	0.31	0.01	0.31	0.01	0.57	0.01
Beech Baron 58P	0.12	-	0.02	-	0.12	-	0.07	-	0.07	-	0.07	-	0.12	-
Conquest II	0.35	0.01	0.05	-	0.35	0.01	0.19	-	0.19	-	0.19	-	0.35	0.01
Learjet 35	0.06	-	0.01	-	0.06	-	0.03	-	0.03	-	0.03	-	0.06	-
Citation I	0.05	-	0.01	-	0.05	-	0.03	-	0.03	-	0.03	-	0.05	-
DC-9	0.04	-	0.01	-	0.04	-	0.02	-	0.02	-	0.02	-	0.04	-
B-212[a]	0.05	-	0.01	-	0.05	-	0.03	-	0.03	-	0.03	-	0.05	-

Aircraft	D8A Day	D8A Night	D9A Day	D9A Night	D10A Day	D10A Night	36ED Day	36ED Night	18ED Day	18ED Night	36WD Day	36WD Night	18WD Day	18WD Night
	Departure Flight Tracks													
A-10	-	-	-	-	-	-	3.43	-	2.29	-	0.38	-	0.25	-
C-130	-	-	-	-	-	-	0.48	-	0.32	-	0.05	-	0.04	-
T-37	-	-	-	-	-	-	0.43	-	0.29	-	0.05	-	0.04	-
T-38	-	-	-	-	-	-	0.66	-	0.44	-	0.07	-	0.05	-
UH-1N	-	-	-	-	-	-	0.24	-	0.16	-	0.03	-	0.02	-
F-16	-	-	-	-	-	-	0.14	-	0.09	-	0.02	-	0.01	-
F-18	-	-	-	-	-	-	0.04	-	0.02	-	-	-	-	-
KC-10	-	-	-	-	-	-	0.23	-	0.15	-	0.03	-	0.02	-
C-9	-	-	-	-	-	-	0.10	-	0.07	-	0.01	-	0.01	-
P-3	-	-	-	-	-	-	0.14	-	0.09	-	0.02	-	0.01	-
T-34	-	-	-	-	-	-	0.03	-	0.02	-	-	-	-	-
T-44	-	-	-	-	-	-	0.02	-	0.01	-	-	-	-	-
C-12	-	-	-	-	-	-	0.09	-	0.06	-	0.01	-	0.01	-
C-21	-	-	-	-	-	-	0.04	-	0.03	-	-	-	-	-
Sgl. Eng. Piston, Fixed Pitch	1.07	0.02	0.59	0.01	0.59	0.01	-	-	-	-	-	-	-	-
Sgl. Eng. Piston, Variable Pitch	0.57	0.01	0.31	0.01	0.31	0.01	-	-	-	-	-	-	-	-
Beech Baron 58P	0.12	-	0.07	-	0.07	-	-	-	-	-	-	-	-	-
Conquest II	0.35	0.01	0.19	-	0.19	-	-	-	-	-	-	-	-	-
Learjet 35	0.06	-	0.03	-	0.03	-	-	-	-	-	-	-	-	-
Citation I	0.05	-	0.03	-	0.03	-	-	-	-	-	-	-	-	-
DC-9	0.04	-	0.02	-	0.02	-	-	-	-	-	-	-	-	-
B-212[a]	0.05	-	0.03	-	0.03	-	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

Table I-5b. Assignment of Operations for Preclosure (1992)

Aircraft	Arrival Flight Tracks																	
	A1A		A2A		A4A		A5A		A6A		A7A		A8A		A9A		36ST	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A-10	0.71	-	0.71	-	0.71	-	0.48	-	0.71	-	0.48	-	0.48	-	0.48	-	0.57	-
C-130	0.10	-	0.10	-	0.10	-	0.07	-	0.10	-	0.07	-	0.07	-	0.07	-	0.08	-
T-37	0.09	-	0.09	-	0.09	-	0.06	-	0.09	-	0.06	-	0.06	-	0.06	-	0.07	-
T-38	0.14	-	0.14	-	0.14	-	0.09	-	0.14	-	0.09	-	0.09	-	0.09	-	0.11	-
UH-1N	0.05	-	0.05	-	0.05	-	0.03	-	0.05	-	0.03	-	0.03	-	0.03	-	0.04	-
F-16	0.03	-	0.03	-	0.03	-	0.02	-	0.03	-	0.02	-	0.02	-	0.02	-	0.02	-
F-18	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-
KC-10	0.05	-	0.05	-	0.05	-	0.03	-	0.05	-	0.03	-	0.03	-	0.03	-	0.04	-
C-9	0.02	-	0.02	-	0.02	-	0.01	-	0.02	-	0.01	-	0.01	-	0.01	-	0.02	-
P-3	0.03	-	0.03	-	0.03	-	0.02	-	0.03	-	0.02	-	0.02	-	0.02	-	0.02	-
T-34	0.01	-	0.01	-	0.01	-	-	-	0.01	-	-	-	-	-	-	-	-	-
T-44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-12	0.02	-	0.02	-	0.02	-	0.01	-	0.02	-	0.01	-	0.01	-	0.01	-	0.02	-
C-21	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-
Sgl. Eng. Piston, Fixed Pitch	2.87	0.05	0.83	0.02	0.83	0.02	0.55	0.01	0.83	0.02	0.55	0.01	0.55	0.01	0.55	0.01	-	-
Sgl. Eng. Piston, Variable Pitch	1.43	0.03	0.44	0.01	0.44	0.01	0.30	0.01	0.44	0.01	0.30	0.01	0.30	0.01	0.30	0.01	-	-
Beech Baron 58P	0.30	0.01	0.09	-	0.09	-	0.06	-	0.09	-	0.06	-	0.06	-	0.06	-	-	-
Conquest II	0.87	0.02	0.27	0.01	0.27	0.01	0.18	-	0.27	0.01	0.18	-	0.18	-	0.18	-	-	-
Learjet 35	0.15	-	0.05	-	0.05	-	0.03	-	0.05	-	0.03	-	0.03	-	0.03	-	-	-
Citation I	0.12	-	0.04	-	0.04	-	0.02	-	0.04	-	0.02	-	0.02	-	0.02	-	-	-
DC-9	0.09	-	0.03	-	0.03	-	0.02	-	0.03	-	0.02	-	0.02	-	0.02	-	-	-
B-212[a]	0.11	-	0.04	-	0.04	-	0.02	-	0.04	-	0.02	-	0.02	-	0.02	-	-	-

Aircraft	Arrival Flight Tracks						Touch-and-Go Flight Tracks											
	18ST		36OT		18OT		36CA		36CB		18CA		18CB		36CC		18CC	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A-10	0.38	-	0.38	-	0.25	-	-	-	0.24	-	-	-	0.16	-	-	-	-	-
C-130	0.05	-	0.05	-	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-
T-37	0.05	-	0.05	-	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
T-38	0.07	-	0.07	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
UH-1N	0.03	-	0.03	-	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-
F-16	0.02	-	0.02	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
F-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KC-10	0.03	-	0.03	-	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-
C-9	0.01	-	0.01	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
P-3	0.02	-	0.02	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
T-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-12	0.01	-	0.01	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
C-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sgl. Eng. Piston, Fixed Pitch	-	-	-	-	-	-	13.93	0.28	-	-	9.29	0.19	-	-	2.46	0.05	1.64	0.03
Sgl. Eng. Piston, Variable Pitch	-	-	-	-	-	-	7.46	0.15	-	-	4.97	0.10	-	-	1.32	0.03	0.88	0.02
Beech Baron 58P	-	-	-	-	-	-	1.59	0.03	-	-	1.06	0.02	-	-	0.28	0.01	0.19	-
Conquest II	-	-	-	-	-	-	0.10	-	-	-	0.07	-	-	-	0.02	-	0.01	-
Learjet 35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Citation I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-212[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

were used to estimate preclosure noise levels. The traffic data used in the analysis are presented in Table I-6. The noise levels generated by surface traffic were predicted using the model published by the Federal Highway Administration (FHWA, 1978). The noise levels are estimated as a function of distance from the centerline of the nearest road. Numbers of residents impacted were determined from aerial photographs dated June 7 and June 12, 1992, and U.S. Geological Survey (USGS) maps (photo revised in 1970, 1975, 1980, and 1981).

1.2 CLOSURE BASELINE

At closure, it is assumed that aircraft activity would continue. The fleet mix and annual operations are presented in Table I-7. The day/night split for aircraft operations is shown in Table I-2. Stage lengths for aircraft operations are given in Table I-3. Flight tracks utilized to model the closure baseline conditions are the same as for preclosure and are presented in Figures I-1 through I-4. Engine runup operations were assumed to occur at pads 1, 2, 3, and 5 (see Figure I-5). The number of runup operations are presented in Table I-4. During typical runup operations, the engines would run for 25 minutes at idle power and 5 minutes at departure power. It was assumed that no hush house or test cell facilities would be available. Daily operations assigned to each flight track are provided in Table I-8.

The noise levels projected for the closure baseline for surface traffic were calculated using the traffic projections at base closure. The AADTs used for the analysis are presented in Table I-6.

1.3 PROPOSED ACTION

The Proposed Action for the reuse of Richards-Gebaur AFB presents a comprehensive reuse plan centered around a mixed-use civil aviation facility. Primary components of the aviation action include air cargo, commuter, private pilot training, maintenance, and general aviation operations in addition to continuing military transient operations. Non-aviation land uses include aviation support, industrial, office/industrial park, commercial, and military. The plan incorporates operations using the main runway and a shortened, reactivated crosswind runway.

The fleet mix and annual aircraft operations for each of the modeled years are contained in Table I-9. The DNL contours for the proposed flight operations are presented in Section 4.4.4, Noise. The military flight tracks modeled are presented in Figures I-1 to I-3 and the civilian flight tracks are presented in Figure I-6. The day-night split for all aircraft operations is shown in Table I-2. Stage lengths for aircraft operations are given in Table I-3.

Table I-6. Surface Traffic Operations for Total Traffic Volumes (Preclosure and Closure)

Roadway	From/to	AADT	Speed Assumed (mph)	Road Width Assumed (no. of lanes)	Day/Night Split (percent)	Percentage Trucks Medium/Heavy
Preclosure						
M-58	US 71 to N Scott Avenue	15,500	45	2	88.6/11.4	2.0/3.0
M-150	Holmes Road to US 71	8,590	55	2	88.6/11.4	2.0/1.0
Andrews Road	M-150 to 155th Street	1,480	45	2	90.0/10.0	2.0/1.0
N Scott Avenue	M-58 to Markey Road	10,380	45	2	90.0/10.0	2.0/1.0
155th Street	US 71 to N Scott Avenue	13,000	45	2	88.6/11.4	2.0/1.0
Markey Road	N Scott Avenue to M-58	3,350	35	2	90.0/10.0	2.0/1.0
Westover Road	Markey Road to M-58	1,730	35	2	90.0/10.0	2.0/1.0
Highway Y	M-58 to US 71	6,130	55	2	88.6/11.4	2.0/1.0
US 71	Highway Y to 155th Street	41,450	55	4	87.0/13.0	2.0/3.0
Closure						
M-58	US 71 to N Scott Avenue	15,404	45	2	88.6/11.4	2.0/3.0
M-150	Holmes Road to US 71	8,192	55	2	88.6/11.4	2.0/1.0
Andrews Road	M-150 to 155th Street	1,082	45	2	90.0/10.0	2.0/1.0
N Scott Avenue	M-58 to Markey Road	10,236	45	2	90.0/10.0	2.0/1.0
155th Street	US 71 to N Scott Avenue	12,564	45	2	88.6/11.4	2.0/1.0
Markey Road	N Scott Avenue to M-58	3,350	35	2	90.0/10.0	2.0/1.0
Westover Road	Markey Road to M-58	1,586	35	2	90.0/10.0	2.0/1.0
Highway Y	M-58 to US 71	6,130	55	2	88.6/11.4	2.0/1.0
US 71	Highway Y to 155th Street	41,327	55	4	87.0/13.0	2.0/3.0

AADT = average annual daily traffic.
M = Missouri Highway.
MPH = miles per hour.
US = United States Highway.

Table I-7. Annual Aircraft Operations for Closure (1994)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			1,001	3
A-10	250	25		
C-130	141	14		
T-37/38	312	31		
UH-1N	66	7		
F-16	39	4		
F-18	11	1		
KC-10	63	6		
C-9	29	3		
P-3	38	4		
T-34	9	1		
T-44	6	<1		
C-12	26	3		
C-21	11	1		
General Aviation			38,466	97
Single Engine Piston, Fixed Pitch	20,543	53		
Single Engine Piston, Variable Pitch	10,997	29		
Beech Baron 58P	2,280	6		
Conquest II	2,626	7		
Dash 7	500	1		
Learjet 35	465	1		
Citation I	377	1		
DC-9	298	<1		
B-212 (helicopter)	380	1		
TOTAL			39,467	100

Table I-8a. Assignment of Operations for Closure (1994)

Aircraft	D1A Day	D1A Night	D2A Day	D2A Night	D3A Day	D3A Night	D4A Day	D4A Night	D5A Day	D5A Night	D6A Day	D6A Night	D7A Day	D7A Night
A-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-130	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-37	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-38	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UH-1N	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KC-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-44	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sgl. Eng. Piston, Fixed Pitch	1.40	0.03	0.19	-	1.40	0.03	0.77	0.02	0.77	0.02	0.77	0.02	1.40	0.03
Sgl. Eng. Piston, Variable Pitch	0.75	0.02	0.10	-	0.75	0.02	0.41	0.01	0.41	0.01	0.41	0.01	0.75	0.02
Beech Baron 58P	0.16	-	0.02	-	0.16	-	0.09	-	0.09	-	0.09	-	0.16	-
Conquest II	0.49	0.01	0.07	-	0.49	0.01	0.27	0.01	0.27	0.01	0.27	0.01	0.49	0.01
Dash 7	0.10	-	0.01	-	0.10	-	0.05	-	0.05	-	0.05	-	0.10	-
Learjet 35	0.09	-	0.01	-	0.09	-	0.05	-	0.05	-	0.05	-	0.09	-
Citation I	0.07	-	0.01	-	0.07	-	0.04	-	0.04	-	0.04	-	0.07	-
DC-9	0.06	-	0.01	-	0.06	-	0.03	-	0.03	-	0.03	-	0.06	-
B-212[a]	0.07	-	0.01	-	0.07	-	0.04	-	0.04	-	0.04	-	0.07	-

Aircraft	D8A Day	D8A Night	D9A Day	D9A Night	D10A Day	D10A Night	36ED Day	36ED Night	18ED Day	18ED Night	36WD Day	36WD Night	18WD Day	18WD Night
A-10	-	-	-	-	-	-	0.20	-	0.13	-	0.02	-	0.01	-
C-130	-	-	-	-	-	-	0.10	-	0.07	-	0.01	-	0.01	-
T-37	-	-	-	-	-	-	0.09	-	0.06	-	0.01	-	0.01	-
T-38	-	-	-	-	-	-	0.13	-	0.09	-	0.01	-	0.01	-
UH-1N	-	-	-	-	-	-	0.05	-	0.03	-	0.01	-	-	-
F-16	-	-	-	-	-	-	0.03	-	0.02	-	-	-	-	-
F-18	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-
KC-10	-	-	-	-	-	-	0.05	-	0.03	-	0.01	-	-	-
C-9	-	-	-	-	-	-	0.02	-	0.01	-	-	-	-	-
P-3	-	-	-	-	-	-	0.03	-	0.02	-	-	-	-	-
T-34	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-
T-44	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-12	-	-	-	-	-	-	0.02	-	0.01	-	-	-	-	-
C-21	-	-	-	-	-	-	0.01	-	0.01	-	-	-	-	-
Sgl. Eng. Piston, Fixed Pitch	1.40	0.03	0.77	0.02	0.77	0.02	-	-	-	-	-	-	-	-
Sgl. Eng. Piston, Variable Pitch	0.75	0.02	0.41	0.01	0.41	0.01	-	-	-	-	-	-	-	-
Beech Baron 58P	0.16	-	0.09	-	0.09	-	-	-	-	-	-	-	-	-
Conquest II	0.49	0.01	0.27	0.01	0.27	0.01	-	-	-	-	-	-	-	-
Dash 7	0.10	-	0.05	-	0.05	-	-	-	-	-	-	-	-	-
Learjet 35	0.09	-	0.05	-	0.05	-	-	-	-	-	-	-	-	-
Citation I	0.07	-	0.04	-	0.04	-	-	-	-	-	-	-	-	-
DC-9	0.06	-	0.03	-	0.03	-	-	-	-	-	-	-	-	-
B-212[a]	0.07	-	0.04	-	0.04	-	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

Table I-8b. Assignment of Operations for Closure (1994)

Aircraft	Arrival Flight Tracks A1A Day	A1A Night	A2A Day	A2A Night	A4A Day	A4A Night	A5A Day	A5A Night	A6A Day	A6A Night	A7A Day	A7A Night	A8A Day	A8A Night	A9A Day	A9A Night	36ST Day	36ST Night
A-10	0.04	-	0.04	-	0.04	-	0.03	-	0.04	-	0.03	-	0.03	-	0.03	-	0.03	-
C-130	0.02	-	0.02	-	0.02	-	0.01	-	0.02	-	0.01	-	0.01	-	0.01	-	0.02	-
T-37	0.02	-	0.02	-	0.02	-	0.01	-	0.02	-	0.01	-	0.01	-	0.01	-	0.01	-
T-38	0.03	-	0.03	-	0.03	-	0.02	-	0.03	-	0.02	-	0.02	-	0.02	-	0.02	-
UH-1N	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-
F-16	0.01	-	0.01	-	0.01	-	-	-	0.01	-	-	-	-	-	-	-	-	-
F-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KC-10	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-
C-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-3	0.01	-	0.01	-	0.01	-	-	-	0.01	-	-	-	-	-	-	-	-	-
T-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sgl. Eng. Piston, Fixed Pitch	3.50	0.07	1.09	0.02	1.09	0.02	0.72	0.01	1.09	0.02	0.72	0.01	0.72	0.01	0.72	0.01	-	-
Sgl. Eng. Piston, Variable Pitch	1.87	0.04	0.58	0.01	0.58	0.01	0.39	0.01	0.58	0.01	0.39	0.01	0.39	0.01	0.39	0.01	-	-
Beech Baron 58P	0.39	0.01	0.12	-	0.12	-	0.08	-	0.12	-	0.08	-	0.08	-	0.08	-	-	-
Conquest II	1.23	0.03	0.38	0.01	0.38	0.01	0.25	0.01	0.38	0.01	0.25	0.01	0.25	0.01	0.25	0.01	-	-
Dash 7	0.25	-	0.08	-	0.08	-	0.05	-	0.08	-	0.05	-	0.05	-	0.05	-	-	-
Learjet 35	0.23	-	0.07	-	0.07	-	0.05	-	0.07	-	0.05	-	0.05	-	0.05	-	-	-
Citation I	0.18	-	0.06	-	0.06	-	0.04	-	0.06	-	0.04	-	0.04	-	0.04	-	-	-
DC-9	0.15	-	0.05	-	0.05	-	0.03	-	0.05	-	0.03	-	0.03	-	0.03	-	-	-
B-212[a]	0.18	-	0.06	-	0.06	-	0.04	-	0.06	-	0.04	-	0.04	-	0.04	-	-	-

Aircraft	Arrival Flight Tracks 18ST Day	18ST Night	36OT Day	36OT Night	18OT Day	18OT Night	Touch-and-Go Flight Tracks 36CA Day	36CA Night	36CB Day	36CB Night	18CA Day	18CA Night	18CB Day	18CB Night	36CC Day	36CC Night	18CC Day	18CC Night
A-10	0.02	-	0.02	-	0.01	-	-	-	0.01	-	-	-	0.01	-	-	-	-	-
C-130	0.01	-	0.01	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
T-37	0.01	-	0.01	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
T-38	0.01	-	0.01	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-
UH-1N	0.01	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KC-10	0.01	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sgl. Eng. Piston, Fixed Pitch	-	-	-	-	-	-	18.28	0.37	-	-	12.19	0.25	-	-	3.23	0.07	2.15	0.04
Sgl. Eng. Piston, Variable Pitch	-	-	-	-	-	-	9.79	0.20	-	-	6.53	0.13	-	-	1.73	0.04	1.15	0.02
Beech Baron 58P	-	-	-	-	-	-	2.03	0.04	-	-	1.35	0.03	-	-	0.36	0.01	0.24	-
Conquest II	-	-	-	-	-	-	0.14	-	-	-	0.10	-	-	-	0.03	-	0.02	-
Dash 7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Learjet 35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Citation I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-212[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

Table I-9a. Annual Aircraft Operations for Proposed Action (1999)

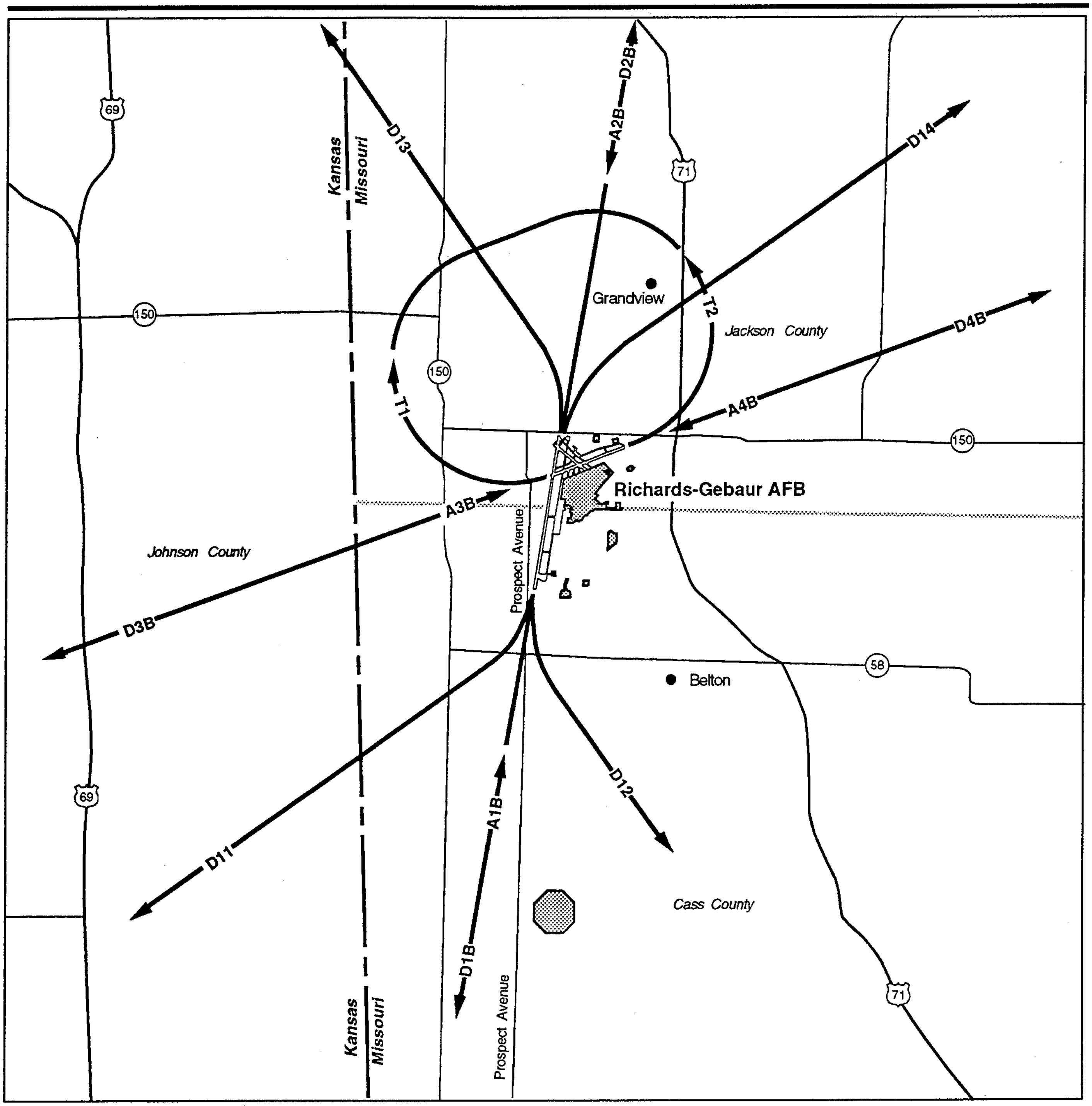
Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			1,000	2
A-10	433	43		
C-130	96	10		
T-37/38	96	10		
UH-1N	99	10		
F-16	50	5		
F-18	13	1		
KC-10	74	7		
C-9	37	4		
P-3	49	5		
T-34	2	<1		
T-44	3	<1		
C-12	34	3		
C-21	14	1		
General Aviation			30,200	52
Single Engine Piston	19,800	66		
Baron 58P (twin engine piston)	5,600	19		
Conquest II (turboprop)	2,500	8		
Citation I (corporate jet)	1,800	6		
B-212 (helicopter)	500	2		
Commuter Passenger Service			1,500	3
Dash-7	1,500	100		
Air Cargo			400	<1
DC-9	400	100		
Aircraft Maintenance			200	<1
L-1011	0	0		
B-727-200	200	100		
Pilot Training			24,700	43
Single Engine Piston	21,000	85		
Baron 58P (twin engine piston)	3,700	15		
TOTAL			58,000	100

Table I-9b. Annual Aircraft Operations for Proposed Action (2004)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			1,000	1
A-10	433	43		
C-130/141	96	10		
T-37/38	96	10		
UH-1N	99	10		
F-16	50	5		
F-18	13	1		
KC-10	74	7		
C-9	37	4		
P-3	49	5		
T-34	2	<1		
T-44	3	<1		
C-12	34	3		
C-21	14	1		
General Aviation			41,500	53
Single Engine Piston	26,000	63		
Baron 58P (twin engine piston)	6,800	16		
Conquest II (turboprop)	4,600	11		
Citation I (corporate jet)	3,100	7		
B-212 (helicopter)	1,000	2		
Commuter Passenger Service			2,500	3
Dash-7	2,500	100		
Air Cargo			900	1
DC-9	900	100		
Aircraft Maintenance			500	<1
L-1011	200	40		
B727-200	300	60		
Pilot Training			31,600	41
Single Engine Piston	26,500	84		
Baron 58P (twin engine piston)	5,100	16		
TOTAL			78,000	100

Table I-9c. Annual Aircraft Operations for Proposed Action (2014)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			1,000	1
A-10	433	43		
C-130	96	10		
T-37/38	96	10		
UH-1N	99	10		
F-16	50	5		
F-18	13	1		
KC-10	74	7		
C-9	37	4		
P-3	49	5		
T-34	2	<1		
T-44	3	<1		
C-12	34	3		
C-21	14	1		
General Aviation			63,700	56
Single Engine Piston	34,900	55		
Baron 58P (twin engine piston)	14,400	23		
Conquest II (turboprop)	8,200	13		
Citation I (corporate jet)	4,700	7		
B-212 (helicopter)	1,500	2		
Commuter Passenger Service			4,000	4
Dash-7	4,000	100		
Air Cargo			1,600	1
DC-9	1,600	100		
Aircraft Maintenance			1,000	1
L-1011	500	50		
B-727-200	500	50		
Pilot Training			42,700	37
Single Engine Piston	36,300	85		
Baron 58P (twin engine piston)	6,400	15		
TOTAL			114,000	100



EXPLANATION

D3B Flight Paths for Richards-Gebaur Airport

71 U.S. Highway

58 State Highway

County Line

State Boundary

0 1/2 1 2 Miles

Civilian Flight Tracks

Figure I-6

Engine runup operations were assumed to occur at pad 3 and the test cell (see Figure I-5). It was assumed that no noise suppression facilities would be available. The number of runup operations are presented in Table I-4. During typical runup operations, the engines would run for 25 minutes at idle power and 5 minutes at departure power. The aircraft were assumed to have a heading of 270 degrees for both locations.

General aviation operations were divided into five types:

- Single-engine, piston-driven propeller - A composite single-engine propeller (COMSEP) plane was modeled.
- Multi-engine, piston-driven propeller - Beech Baron 58P assumed to be a typical multi-engine propeller plane.
- Turboprop - Cessna Conquest II assumed to be a typical turboprop.
- Turbofan - Cessna Citation I assumed to be a typical turbofan.
- Helicopter - Bell 212 assumed to be a typical helicopter.

The civilian touch and go patterns and the initial departure and final approach flight tracks used in the modeling are shown in Figure I-6. Military flight tracks are shown in Figures I-1 through I-3. The touch-and-go flight tracks were based on those in common usage at similar sized airports. Touch-and-go operations were assumed to consist entirely of pilot proficiency training operations and were split 60/40 on two tracks (one for Runway 24 and one for Runway 06). Assignment of military transient operations on each flight track are shown in Table I-10; these operations assignments are the same for all years. Daily civilian operations assigned to each flight track and time period for the Proposed Action are provided in Table I-11 for each of the study years. Assignments were made in a similar way for the other alternatives.

A standard 3 degree glide slope and the takeoff profiles provided by the Federal Aviation Administration's (FAA's) Integrated Noise Model Database 3.10 (FAA, 1992) were assumed for all civilian aircraft. Glide slopes and takeoff profiles for military aircraft are provided in the Noise Exposure Model (NOISEMAP) model.

Surface traffic data used in the modeling were developed from the project traffic study presented in the Section 4.2.3, Transportation, and are shown in Table I-12. The traffic mix, day/night split, and speed were assumed to remain the same as for the preclosure reference. Surface traffic noise levels along key road segments are presented on Table I-13 in terms of DNL as a function of distance from the roadway centerline. The number of residents within the DNL

Table I-10. Assignment of Military Operations for Proposed Action (all years)

	Departure Flight Tracks								Touch-and-Go Flight Tracks			
	36ED		18ED		36WD		18WD		36CB		18CB	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A-10	0.31	-	0.21	-	0.03	-	0.02	-	0.02	--	0.01	-
C-130	0.07	-	0.05	-	0.01	-	0.01	-	-	-	-	-
T-37	0.03	-	0.02	-	-	-	-	-	-	-	-	-
T-38[a]	0.04	-	0.03	-	-	-	-	-	-	-	-	-
UH-1N	0.07	-	0.05	-	0.01	-	0.01-	-	-	-	-	-
F-16[a]	0.04	-	0.02	-	-	-	-	-	-	-	-	-
F-18[a]	0.01	-	0.01-	-	-	-	-	-	-	-	-	-
KC-10[a]	0.05	-	0.04	-	0.01	-	-	-	-	-	-	-
C-9	0.03	-	0.02	-	-	-	-	-	-	-	-	-
P-3	0.04	-	0.02	-	-	-	-	-	-	-	-	-
C-12	0.02	-	0.02-	-	-	-	-	-	-	-	-	-
C-21	0.01	-	0.01	-	-	-	-	-	-	-	-	-

	Arrival Flight Tracks																							
	A1A		A2A		A4A		A5A		A6A		A7A		A8A		A9A		36ST		18ST		360T		180T	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A-10	0.06	-	0.06	-	0.06	-	0.04	-	0.06	-	0.04	-	0.04	-	0.04	-	0.05	-	0.03	-	0.03	-	0.02	-
C-130	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-
T-37	0.01	-	0.01	-	0.01	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-38[a]	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-
UH-1N	0.02	-	0.02	-	0.02	-	0.02	-	0.02	-	0.01	-	0.01	-	0.01	-	0.01	-	-	-	-	-	-	-
F-16[a]	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	-	-	-	-	-	-
F-18[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KC-10[a]	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	-	-
C-9	0.01	-	0.01	-	0.01	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-3	0.01	-	0.01	-	0.01	-	0.01-	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	-	-	-	-	-	-
C-12	0.01	-	0.01	-	0.01	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table I-11a. Assignment of Civilian Operations for Proposed Action (1999)

	Departure Flight Tracks															
	D1B		D11		D12		D2B		D13		D14		D3B		D4B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	0.30	-	0.30	-	0.30	-	0.20	-	0.20	-	0.20	-	-	-	-	-
DC-9	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	-	-	-	-
L-1011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-727-200 Retrofit	0.05	-	0.05	-	0.05	-	0.04	-	0.04	-	0.04	-	-	-	-	-
COMSEP	1.39	0.01	1.39	0.01	1.39	0.01	0.93	0.01	0.93	0.01	0.93	0.01	16.70	0.16	11.13	0.11
Beech Baron 58P	1.58	0.02	1.58	0.02	1.58	0.02	1.06	0.01	1.06	0.01	1.06	0.01	-	-	-	-
Conquest II	0.67	0.01	0.67	0.01	0.67	0.01	0.45	0.01	0.45	0.01	0.45	0.01	-	-	-	-
Citation I	0.48	0.01	0.48	0.01	0.48	0.01	0.32	0.01	0.32	0.01	0.32	0.01	-	-	-	-
B-212[a]	0.13	-	0.13	-	0.13	-	0.09	-	0.09	-	0.09	-	-	-	-	-

	Arrival Flight Tracks								Touch-and-Go Flight Tracks			
	A1B		A2B		A3B		A4B		T1		T2	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	0.60	-	0.90		-	-	-	-	0.34	-	0.22	-
DC-9	0.11	0.11	0.16	0.16	-	-	-	-	-	-	-	-
L-1011	-	-	-	-	-	-	-	-	-	-	-	-
B-727-200 Retrofit	0.11	-	0.16	-	-	-	-	-	-	-	-	-
COMSEP	2.78	0.03	4.17	0.04	11.13	0.11	16.70	0.16	12.34	0.12	8.23	0.08
Beech Baron 58P	3.17	0.04	4.75	0.06	-	-	-	-	2.80	0.03	1.87	0.02
Conquest II	1.34	0.03	2.01	0.04	-	-	-	-	-	-	-	-
Citation I	0.97	0.02	1.45	0.03	-	-	-	-	-	-	-	-
B-212[a]	0.27	0.01	0.40	0.01	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

Table I-11b. Assignment of Civilian Operations for Proposed Action (2004)

	Departure Flight Tracks															
	D1B		D11		D12		D2B		D13		D14		D3B		D4B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	0.50	-	0.50	-	0.50	-	0.33	-	0.33	-	0.33	-	-	-	-	-
DC-9	0.12	0.12	0.12	0.12	0.12	0.12	0.08	0.08	0.08	0.08	0.08	0.08	-	-	-	-
L-1011	0.05	-	0.05	-	0.05	-	0.04	-	0.04	-	0.04	-	-	-	-	-
B-727-200 Retrofit	0.08	-	0.08	-	0.08	-	0.05	-	0.05	-	0.05	-	-	-	-	-
COMSEP	1.79	0.02	1.79	0.02	1.79	0.02	1.19	0.01	1.19	0.01	1.19	0.01	21.48	0.21	14.32	0.14
Beech Baron 58P	2.03	0.02	2.03	0.02	2.03	0.02	1.35	0.02	1.35	0.02	1.35	0.02	-	-	-	-
Conquest II	1.24	0.03	1.24	0.03	1.24	0.03	0.82	0.02	0.82	0.02	0.82	0.02	-	-	-	-
Citation I	0.83	0.02	0.83	0.02	0.83	0.02	0.55	0.01	0.55	0.01	0.55	0.01	-	-	-	-
B-212[(a)]	0.27	0.01	0.27	0.01	0.27	0.01	0.18	-	0.18	-	0.18	-	-	-	-	-

	Arrival Flight Tracks								Touch-and-Go Flight Tracks			
	A1B		A2B		A3B		A4B		T1		T2	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	1.00	-	1.49		-	-	-	-	0.56	-	0.37	-
DC-9	0.25	0.25	0.37	0.37	-	-	-	-	-	-	-	-
L-1011	0.11	-	0.16	-	-	-	-	-	-	-	-	-
B-727-200 Retrofit	0.16	-	0.25	-	-	-	-	-	-	-	-	-
COMSEP	3.58	0.04	5.37	0.06	14.32	0.14	21.48	0.21	15.88	0.16	10.58	0.10
Beech Baron 58P	4.05	0.05	6.08	0.07	-	-	-	-	3.58	0.04	2.39	0.03
Conquest II	2.47	0.05	3.71	0.08	-	-	-	-	-	-	-	-
Citation I	1.66	0.03	2.50	0.05	-	-	-	-	-	-	-	-
B-212[(a)]	0.54	0.01	0.81	0.02	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

Table I-11c. Assignment of Civilian Operations for Proposed Action (2014)

	Departure Flight Tracks															
	D1B		D11		D12		D2B		D13		D14		D3B		D4B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	0.80	-	0.80	-	0.80	-	0.53	-	0.53	-	0.53	-	-	-	-	-
DC-9	0.22	0.22	0.22	0.22	0.22	0.22	0.15	0.15	0.15	0.15	0.15	0.15	-	-	-	-
L-1011	0.14	-	0.14	-	0.14	-	0.09	-	0.09	-	0.09	-	-	-	-	-
B-727-200 Retrofit	0.14	-	0.14	-	0.14	-	0.09	-	0.09	-	0.09	-	-	-	-	-
COMSEP	2.43	0.02	2.43	0.02	2.43	0.02	1.62	0.02	1.62	0.02	1.62	0.02	29.14	0.29	19.42	0.19
Beech Baron 58P	3.54	0.04	3.54	0.04	3.54	0.04	2.36	0.03	2.36	0.03	2.36	0.03	-	-	-	-
Conquest II	2.20	0.04	2.20	0.04	2.20	0.04	1.47	0.03	1.47	0.03	1.47	0.03	-	-	-	-
Citation I	1.26	0.03	1.26	0.03	1.26	0.03	0.84	0.02	0.84	0.02	0.84	0.02	-	-	-	-
B-212[a]	0.40	0.01	0.40	0.01	0.40	0.01	0.27	0.01	0.27	0.01	0.27	0.01	-	-	-	-

	Arrival Flight Tracks								Touch-and-Go Flight Tracks			
	A1B		A2B		A3B		A4B		T1		T2	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	1.59	-	2.39	-	-	-	-	-	0.90	-	0.60	-
DC-9	0.44	0.44	0.66	0.66	-	-	-	-	-	-	-	-
L-1011	0.27	-	0.41	-	-	-	-	-	-	-	-	-
B-727-200 Retrofit	0.27	-	0.41	-	-	-	-	-	-	-	-	-
COMSEP	4.86	0.05	7.28	0.07	19.42	0.19	29.14	0.29	21.53	0.21	14.35	0.14
Beech Baron 58P	7.09	0.09	10.63	0.13	-	-	-	-	6.26	0.08	4.17	0.05
Conquest II	4.40	0.09	6.60	0.13	-	-	-	-	-	-	-	-
Citation I	2.52	0.05	3.79	0.08	-	-	-	-	-	-	-	-
B-212[a]	0.81	0.02	1.21	0.02	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

Table I-12. Surface Traffic Operations for Total Traffic Volumes (Project and Non-Project)
Page 1 of 2

Alternative / Roadway	From/to	AADT 1999	AADT 2004	AADT 2014	Speed Assumed (mph)	Road Width Assumed (No. of Lanes)
Proposed Action						
M-58	US 71 to N Scott Avenue	15,946	16,452	17,495		
M-150	Holmes Road to US 71	10,832	13,670	21,042	45	4
Andrews Road	M-150 to 155th Street	1,878	2,446	3,584	55	4
N Scott Avenue	M-58 to Markey Road	10,726	11,154	12,030	45	2
155th Street	US 71 to N Scott Avenue	13,350	14,005	15,340	45	4
Markey Road	N Scott Avenue to Westover Road	3,435	3,521	3,701	35	2
Westover Road	Markey Road to M-58	1,858	2,062	2,473	35	2
Highway Y	M-58 to US 71	6,285	6,443	6,773	55	2
US 71	Highway to 155th Street	45,826	50,714	62,025	55	6
Aviation Alternative						
M-58	US 71 to N Scott Avenue	16,044	16,521	17,364	45	4
M-150	Holmes Road to US 71	11,966	15,648	25,834	55	4
Andrews Road	M-150 to 155th Street	2,389	2,792	2,927	45	2
N Scott Avenue	M-58 to Markey Road	10,874	11,258	11,832	45	4
155th Street	US 71 to N Scott Avenue	13,650	14,216	14,939	45	2
Markey Road	N Scott Avenue to Westover Road	3,435	3,521	3,701	35	2
Westover Road	Markey Road to M-58	2,006	2,168	2,274	35	2
Highway Y	M-58 to US 71	6,285	6,443	6,773	55	2
US 71	Highway to 155th Street	45,952	50,803	61,855	55	6
Aviation with Mixed Use Alternative						
M-58	US 71 to N Scott Avenue	16,153	16,606	17,493	45	4
M-150	Holmes Road to US 71	12,514	16,077	26,282	55	4
Andrews Road	M-150 to 155th Street	2,917	3,221	3,575	45	2
N Scott Avenue	M-58 to Markey Road	11,039	11,388	12,027	45	4
155th Street	US 71 to N Scott Avenue	13,985	14,478	15,334	45	2
Markey Road	N Scott Avenue to Westover Road	3,435	3,521	3,701	35	2
Westover Road	Markey Road to M-58	2,171	2,295	2,470	35	2
Highway Y	M-58 to US 71	6,285	6,443	6,773	55	2
US 71	Highway Y to 155th Street	46,094	50,914	62,022	55	6
Industrial Use Alternative						
M-58	US 71 to N Scott Avenue	15,977	16,487	17,373	45	4
M-150	Holmes Road to US 71	11,633	15,475	25,679	55	4
Andrews Road	M-150 to 155th Street	2,036	2,619	2,973	45	2
N Scott Avenue	M-58 to Markey Road	10,774	11,206	11,845	45	4
155th Street	US 71 to N Scott Avenue	13,447	14,111	14,966	45	2
Markey Road	N Scott Avenue to Westover Road	3,435	3,521	3,701	35	2
Westover Road	Markey Road to M-58	1,905	2,114	2,288	35	2

AADT = average annual daily traffic.
M = Missouri Highway.
mph = miles per hour.
US = United States Highway.

Table I-12. Surface Traffic Operations for Total Traffic Volumes (Project and Non-Project)
Page 2 of 2

Alternative / Roadway	From/to	AADT 1999	AADT 2004	AADT 2014	Speed Assumed (mph)	Road Width Assumed (No. of Lanes)
Industrial Use Alternative (Continued)						
Highway Y	M-58 to US 71	6,285	6,443	6,773	55	2
US 71	Highway Y to 155th Street	45,867	50,759	61,887	55	6
No-Action Alternative						
M-58	US 71 to N Scott Avenue	15,793	16,192	17,020	45	4
M-150	Holmes Road to US 71	10,707	13,993	23,902	55	4
Andrews Road	M-150 to 155th Street	1,109	1,137	1,195	45	2
N Scott Avenue	M-58 to Markey Road	10,494	10,759	11,310	45	4
155th Street	US 71 to N Scott Avenue	12,881	13,207	13,882	45	2
Markey Road	N Scott Avenue to Westover Road	3,435	3,521	3,701	35	2
Westover Road	Markey Road to M-58	1,626	1,667	1,752	35	2
Highway Y	M-58 to US 71	6,285	6,443	6,773	55	2
US 71	Highway Y to 155th St	45,628	50,377	61,410	55	6

AADT = average annual daily traffic.
M = Missouri Highway.
mph = miles per hour.
US = United States Highway.

Table I-13. Distance to DNL from Roadway Centerline - Proposed Action

Year	Roadway	Segment	DNL 70dB Distance (feet)	DNL 70dB Number of Residents	DNL 75dB Distance (feet)	DNL 75dB Number of Residents	DNL >75dB Distance (feet)	DNL >75dB Number of Residents
1999	M-58	US 71 to N Scott Avenue	120	0	50	0	30	0
	M-150	Holmes Road to US 71	100	0	50	0	20	0
	Andrews Road	M-150 to 155th Street	20	0	(a)	NA	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	20	0
	155th Street	US 71 to N Scott Avenue	80	0	40	0	20	0
	Markey Road	N Scott Ave to Westover Road	20	0	(a)	NA	(a)	NA
	Westover Road	Markey Road to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	30	0	20	0
	US 71	Highway Y to 155th Street	330	146	160	65	80	0
2004	M-58	US 71 to N Scott Avenue	120	0	60	0	30	0
	M-150	Holmes Road to US 71	120	0	50	0	30	0
	Andrews Road	M-150 to 155th Street	30	0	(a)	NA	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	20	0
	155th Street	US 71 to N Scott Avenue	80	0	40	0	20	0
	Markey Road	N Scott Ave to Westover Road	20	0	(a)	NA	(a)	NA
	Westover Road	Markey Road to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	40	0	20	0
	US 71	Highway Y to 155th Street	350	146	170	65	90	0
2014	M-58	US 71 to N Scott Avenue	130	0	60	0	30	0
	M-150	Holmes Road to US 71	150	3	70	0	40	0
	Andrews Road	M-150 to 155th Street	30	0	20	0	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	20	0
	155th Street	US 71 to N Scott Avenue	90	0	40	0	20	0
	Markey Road	N Scott Avenue to Westover Road	30	0	(a)	NA	(a)	NA
	Westover Road	Markey Road to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	40	0	20	0
	US 71	Highway Y to 155th Street	400	224	190	88	100	0

Note: (a) Contained within roadway.
db = decibel.
DNL = day-night average sound level.
M = Missouri Highway.
NA = Not applicable for this roadway.
US = United States Highway.

65, 70, and 75 dB levels are also shown. Numbers of residents impacted were determined from aerial photographs dated June 7 and June 12, 1992, and USGS maps (photorevised in 1970, 1975, 1980, and 1981).

1.4 AVIATION ALTERNATIVE

The Aviation Alternative for the reuse of Richards-Gebaur AFB would result in a comprehensive reuse plan centered around a mixed-use civil aviation facility. Primary components of the aviation action include air cargo, commuter, jet pilot training, maintenance, and general aviation operations in addition to continuing military transient operations. Non-aviation land uses include industrial, aviation support, residential, and public facilities/ recreation. The plan incorporates operations using the main runway and a reactivated crosswind runway.

The fleet mix and annual aircraft operations for each of the modeled years are contained in Table I-14. The DNL contours for the proposed flight operations are presented in Section 4.4.4, Noise. The military flight tracks modeled are presented in Figures I-1 to I-3 and the civilian flight tracks are presented in Figure I-6. The day-night split for all aircraft operations is shown in Table I-2. Stage lengths for aircraft operations are given in Table I-3.

Engine runup operations were assumed to occur at pad 3 and the test cell (see Figure I-5). It was assumed that no noise suppression facilities would be available. The number of runup operations are presented in Table I-4. During typical runup operations, the engines would run for 25 minutes at idle power and 5 minutes at departure power. The aircraft were assumed to have a heading of 270 degrees for both locations.

General aviation operations were divided into the same five types as discussed for the Proposed Action.

The civilian touch and go patterns and the initial departure and final approach flight tracks used in the modeling are shown in Figure I-6. Military flight tracks are shown in Figures I-1 through I-3. The touch-and-go flight tracks were based on those in common usage at similar sized airports. Touch-and-go operations were assumed to consist entirely of pilot proficiency training operations and were split 60/40 on two tracks (one for Runway 24 and one for Runway 06). Assignment of military transient operations on each flight track are shown in Table I-15; these operations assignments are the same for all years. Daily civilian operations assigned to each flight track and time period for the Aviation Alternative are provided in Table I-16 for each of the study years. Assignments were made in a similar way for the other alternatives.

Table I-14a. Annual Aircraft Operations for Aviation Alternative (1999)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			1,001	2
A-10	250	25		
C-130	141	14		
T-37/38	312	31		
UH-1N	66	7		
F-16	39	4		
F-18	11	1		
KC-10	63	6		
C-9	29	3		
P-3	38	4		
T-34	9	1		
T-44	6	<1		
C-12	26	3		
C-21	11	1		
General Aviation			51,001	94
Single Engine Piston	41,310	81		
Beech Baron 58P (twin engine piston)	3,060	6		
Conquest II (turboprop)	3,826	8		
Citation I (corporate jet)	2,040	4		
B-212 (helicopter)	765	<2		
Commuter Passenger Service			520	1
Dash-7	520	100		
Air Cargo			520	1
DC-9	520	100		
Aircraft Maintenance			500	1
L-1011	50	10		
MD-80	150	30		
B-727-200	300	60		
Pilot Training			500	1
MD-80	500	100		
TOTAL			54,042	100

Table I-14b. Annual Aircraft Operations for Aviation Alternative (2004)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			1,001	1
A-10	250	25		
C-130/141	141	14		
T-37/38	312	31		
UH-1N	66	7		
F-16	39	4		
F-18	11	1		
KC-10	63	6		
C-9	29	3		
P-3	38	4		
T-34	9	1		
T-44	6	<1		
C-12	26	3		
C-21	11	1		
General Aviation			65,000	93
Single Engine Piston	51,350	79		
Beech Baron 58P (twin engine piston)	3,900	6		
Conquest II (turboprop)	5,038	8		
Citation I (corporate jet)	3,412	5		
B-212 (helicopter)	1,300	2		
Commuter Passenger Service			1,040	2
Dash-7	1,040	100		
Air Cargo			1,040	2
DC-9	1,040	100		
Aircraft Maintenance			1,000	1
L-1011	100	10		
MD-80	300	30		
B-727-200	600	60		
Pilot Training			1,000	1
MD-80	1,000	100		
TOTAL			70,081	100

Table I-14c. Annual Aircraft Operations for Aviation Alternative (2014)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			1,001	1
A-10	250	25		
C-130/141	141	14		
T-37/38	312	31		
UH-1N	66	7		
F-16	39	4		
F-18	11	1		
KC-10	63	6		
C-9	29	3		
P-3	38	4		
T-34	9	1		
T-44	6	<1		
C-12	26	3		
C-21	11	1		
General Aviation			89,001	93
Single Engine Piston	66,750	75		
Beech Baron 58P (twin engine piston)	5,340	6		
Conquest II (turboprop)	7,343	8		
Citation I (corporate jet)	6,898	8		
B-212 (helicopter)	2,670	3		
Commuter Passenger Service			1,560	2
Dash-7	1,560	100		
Air Cargo			1,560	2
DC-9	1,560	100		
Aircraft Maintenance			1,500	<2
L-1011	150	10		
MD-80	450	30		
B-727-200	900	60		
Pilot Training			1,500	<2
MD-80	1,500	100		
TOTAL			96,122	100

Table I-15. Assignment of Military Operations for Aviation, Aviation with Mixed Use, and Industrial Alternatives (all years)

	Departure Flight Tracks								Touch-and-Go Flight Tracks			
	36ED		18ED		36WD		18WD		36CB		18CB	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A-10	0.20	-	0.13	-	0.02	-	0.01	-	0.01	--	0.01	-
C-130	0.10	-	0.07	-	0.01	-	0.01	-	-	-	-	-
T-37	0.09	-	0.06	-	0.01	-	0.01	-	-	-	-	-
T-38[a]	0.13	-	0.09	-	0.01	-	0.01	-	-	-	-	-
UH-1N	0.05	-	0.03	-	0.01	-	-	-	-	-	-	-
F-16[a]	0.03	-	0.02	-	-	-	-	-	-	-	-	-
F-18[a]	0.01	-	-	-	-	-	-	-	-	-	-	-
KC-10[a]	0.05	-	0.03	-	0.01	-	-	-	-	-	-	-
C-9	0.02	-	0.01	-	-	-	-	-	-	-	-	-
P-3	0.03	-	0.02	-	-	-	-	-	-	-	-	-
T-34	0.01	-	-	-	-	-	-	-	-	-	-	-
T-44	-	-	-	-	-	-	-	-	-	-	-	-
C-12	0.02	-	0.01	-	-	-	-	-	-	-	-	-
C-21	0.01	-	0.01	-	-	-	-	-	-	-	-	-

	Arrival Flight Tracks																							
	A1A		A2A		A4A		A5A		A6A		A7A		A8A		A9A		36ST		18ST		36OT		18OT	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A-10	0.04	-	0.04	-	0.04	-	0.03	-	0.04	-	0.03	-	0.03	-	0.03	-	0.03	-	0.02	-	0.02	-	0.01	-
C-130	0.02	-	0.02	-	0.02	-	0.01	-	0.02	-	0.01	-	0.01	-	0.01	-	0.02	-	0.01	-	0.01	-	0.01	-
T-37	0.02	-	0.02	-	0.02	-	0.01	-	0.02	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-
T-38[a]	0.03	-	0.03	-	0.03	-	0.02	-	0.03	-	0.02	-	0.02	-	0.02	-	0.02	-	0.01	-	0.01	-	0.01	-
UH-1N	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	-	-
F-16[a]	0.01	-	0.01	-	0.01	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F-18[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KC-10[a]	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	-	-
C-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-3	0.01	-	0.0	-	0.01	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T-44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: (a) Aircraft not included in Aviation with Mixed Use Alternative.

Table I-16a. Assignment of Civilian Operations for Aviation Alternative (1999)

	Departure Flight Tracks															
	D1B		D11		D12		D2B		D13		D14		D3B		D4B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	0.14	-	0.14	-	0.14	-	0.09	-	0.09	-	0.09	-	-	-	-	-
DC-9	0.07	0.07	0.07	0.07	0.07	0.07	0.05	0.05	0.05	0.05	0.05	0.05	-	-	-	-
MD-80	0.18	-	0.18	-	0.18	-	0.12	-	0.12	-	0.12	-	-	-	-	-
L-1011	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	0.01	-	-	-	-	-
B-727-200 Retrofit	0.08	-	0.08	-	0.08	-	0.05	-	0.05	-	0.05	-	-	-	-	-
COMSEP	1.55	0.03	1.55	0.03	1.55	0.03	1.04	0.02	1.04	0.02	1.04	0.02	18.63	0.38	12.42	0.25
Beech Baron 58P	0.82	0.02	0.82	0.02	0.82	0.02	0.55	0.01	0.55	0.01	0.55	0.01	-	-	-	-
Conquest II	1.03	0.02	1.03	0.02	1.03	0.02	0.69	0.01	0.69	0.01	0.69	0.01	-	-	-	-
Citation I	0.55	0.01	0.55	0.01	0.55	0.01	0.37	0.01	0.37	0.01	0.37	0.01	-	-	-	-
B-212[a]	0.21	-	0.21	-	0.21	-	0.14	-	0.14	-	0.14	-	-	-	-	-

	Arrival Flight Tracks								Touch-and-Go Flight Tracks			
	A1B		A2B		A3B		A4B		T1		T2	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	0.28	-	0.43		-	-	-	-	-	-	-	-
DC-9	0.14	0.14	0.21	0.21	-	-	-	-	-	-	-	-
MD-80	0.35	-	0.53	-	-	-	-	-	-	-	-	-
L-1011	0.03	-	0.04	-	-	-	-	-	-	-	-	-
B-727-200 Retrofit	0.16	-	0.25	-	-	-	-	-	-	-	-	-
COMSEP	3.11	0.06	4.66	0.10	12.42	0.25	18.63	0.38	9.98	0.20	6.65	0.14
Beech Baron 58P	1.64	0.03	2.46	0.05	-	-	-	-	-	-	-	-
Conquest II	2.06	0.04	3.08	0.06	-	-	-	-	-	-	-	-
Citation I	1.10	0.02	1.64	0.03	-	-	-	-	-	-	-	-
B-212[a]	0.41	0.01	0.62	0.01	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

Table I-16b. Assignment of Civilian Operations for Aviation Alternative (2004)

	Departure Flight Tracks															
	D1B		D11		D12		D2B		D13		D14		D3B		D4B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	0.28	-	0.28	-	0.28	-	0.19	-	0.19	-	0.19	-	-	-	-	-
DC-9	0.14	0.14	0.14	0.14	0.14	0.14	0.09	0.09	0.09	0.09	0.09	0.09	-	-	-	-
MD-80	0.35	-	0.35	-	0.35	-	0.23	-	0.23	-	0.23	-	-	-	-	-
L-1011	0.03	-	0.03	-	0.03	-	0.02	-	0.02	-	0.02	-	-	-	-	-
B-727-200 Retrofit	0.16	-	0.16	-	0.16	-	0.11	-	0.11	-	0.11	-	-	-	-	-
COMSEP	1.93	0.04	1.93	0.04	1.93	0.04	1.29	0.03	1.29	0.03	1.29	0.03	23.16	0.47	15.44	0.32
Beech Baron 58P	1.05	0.02	1.05	0.02	1.05	0.02	0.70	0.01	0.70	0.01	0.70	0.01	-	-	-	-
Conquest II	1.35	0.03	1.35	0.03	1.35	0.03	0.90	0.02	0.90	0.02	0.90	0.02	-	-	-	-
Citation I	0.92	0.02	0.92	0.02	0.92	0.02	0.61	0.01	0.61	0.01	0.61	0.01	-	-	-	-
B-212[a]	0.36	-	0.36	-	0.36	-	0.24	-	0.24	-	0.24	-	-	-	-	-

	Arrival Flight Tracks								Touch-and-Go Flight Tracks			
	A1B		A2B		A3B		A4B		T1		T2	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	0.57	-	0.85		-	-	-	-	-	-	-	-
DC-9	0.28	0.28	0.43	0.43	-	-	-	-	-	-	-	-
MD-80	0.71	-	1.07	-	-	-	-	-	-	-	-	-
L-1011	0.05	-	0.08	-	-	-	-	-	-	-	-	-
B-727-200 Retrofit	0.33	-	0.49	-	-	-	-	-	-	-	-	-
COMSEP	3.86	0.08	5.79	0.12	15.44	0.32	23.16	0.47	12.41	0.25	8.27	0.17
Beech Baron 58P	2.09	0.04	3.14	0.06	-	-	-	-	-	-	-	-
Conquest II	2.71	0.06	4.06	0.08	-	-	-	-	-	-	-	-
Citation I	1.83	0.04	2.75	0.06	-	-	-	-	-	-	-	-
B-212[a]	0.70	0.02	1.05	0.02	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

Table I-16c. Assignment of Civilian Operations for Aviation Alternative (2014)

	Departure Flight Tracks															
	D1B		D11		D12		D2B		D13		D14		D3B		D4B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	0.43	-	0.43	-	0.43	-	0.28	-	0.28	-	0.28	-	-	-	-	-
DC-9	0.21	0.21	0.21	0.21	0.21	0.21	0.14	0.14	0.14	0.14	0.14	0.14	-	-	-	-
MD-80	0.53	-	0.53	-	0.53	-	0.35	-	0.35	-	0.35	-	-	-	-	-
L-1011	0.04	-	0.04	-	0.04	-	0.03	-	0.03	-	0.03	-	-	-	-	-
B-727-200 Retrofit	0.25	-	0.25	-	0.25	-	0.16	-	0.16	-	0.16	-	-	-	-	-
COMSEP	2.51	0.05	2.51	0.05	2.51	0.05	1.67	0.03	1.67	0.03	1.67	0.03	30.11	0.61	20.07	0.41
Beech Baron 58P	1.43	0.03	1.43	0.03	1.43	0.03	0.96	0.02	0.96	0.02	0.96	0.02	-	-	-	-
Conquest II	1.97	0.04	1.97	0.04	1.97	0.04	1.31	0.03	1.31	0.03	1.31	0.03	-	-	-	-
Citation I	1.85	0.04	1.85	0.04	1.85	0.04	1.23	0.03	1.23	0.03	1.23	0.03	-	-	-	-
B-212[(a)]	0.73	-	0.73	-	0.73	-	0.49	-	0.49	-	0.49	-	-	-	-	-

	Arrival Flight Tracks								Touch-and-Go Flight Tracks			
	A1B		A2B		A3B		A4B		T1		T2	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Dash-7	0.85	-	1.28		-	-	-	-	-	-	-	-
DC-9	0.43	0.43	0.64	0.64	-	-	-	-	-	-	-	-
MD-80	1.07	-	1.50	-	-	-	-	-	-	-	-	-
L-1011	0.08	-	0.12	-	-	-	-	-	-	-	-	-
B-727-200 Retrofit	0.49	-	0.74	-	-	-	-	-	-	-	-	-
COMSEP	5.02	0.10	7.53	0.15	20.07	0.41	30.11	0.61	16.13	0.33	10.75	0.22
Beech Baron 58P	2.87	0.06	4.30	0.09	-	-	-	-	-	-	-	-
Conquest II	3.94	0.08	5.91	0.12	-	-	-	-	-	-	-	-
Citation I	3.70	0.08	5.56	0.11	-	-	-	-	-	-	-	-
B-212[(a)]	1.43	0.03	2.16	0.03	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

A standard 3 degree glide slope and the takeoff profiles provided by the Federal Aviation Administration's (FAA's) Integrated Noise Model Database 3.10 (FAA, 1992) were assumed for all civilian aircraft. Glide slopes and takeoff profiles for military aircraft are provided in the NOISEMAP model.

Surface traffic data used in the modeling were developed from the project traffic study presented in the Section 4.2.3, Transportation, and are shown in Table I-12. The traffic mix, day/night split, and speed were assumed to remain the same as for the preclosure reference. Surface traffic noise levels along key road segments are presented on Table I-17 in terms of DNL as a function of distance from the roadway centerline. The number of residents within the DNL 65, 70, and 75 dB levels are also shown. Numbers of residents impacted were determined from aerial photographs dated June 7 and June 12, 1992, and USGS maps (photorevised in 1970, 1975, 1980, and 1981).

1.5 AVIATION WITH MIXED USE ALTERNATIVE

Under the Aviation with Mixed Use Alternative, as in the Aviation Alternative, the base airfield would be primarily a civil aviation facility. The primary components of the aviation action are general aviation operations and pilot training; there will also be a small number of military transient operations. Non-aviation land uses include aviation support, industrial, institutional (education), commercial, and public facilities/recreation.

The plan incorporates a shortened main runway and a shortened, reactivated crosswind runway.

The fleet mix and annual operations for each of the modeled years are contained in Table I-18. The DNL contours for the proposed flight operations are presented in Section 4.4.4, Noise. The proposed flight tracks modeled are slightly different from those for the Aviation Alternative due to the shortened runway configuration described above. The Aviation with Mixed Use Alternative civilian flight tracks are presented in Figure I-6. Military flight tracks are shown in Figures I-1 to I-3. The day-night split for all aircraft operations is given in Table I-2. Stage lengths for air operations are given in Table I-3. Daily civilian operations assigned to each flight track are provided in Table I-19. Assignment of military operations would be the same as shown in Table I-10, except that the T-38, F-16, F-18, and KC-10 are not included in this alternative.

No runup operations were assumed for the Aviation with Mixed Use Alternative.

General aviation operations would be divided into the same five types as in the Aviation Alternative. It was assumed that 60 percent of the single-

Table I-17. Distance to DNL from Roadway Centerline - Aviation Alternative

Year	Roadway	Segment	DNL 70dB Distance (feet)	DNL 70dB Number of Residents	DNL 75dB Distance (feet)	DNL 75dB Number of Residents	DNL >75dB Distance (feet)	DNL >75dB Number of Residents
1999	M-58	US 71 to N Scott Avenue	120	0	60	0	30	0
	M-150	Holmes Road to US 71	110	0	50	0	30	0
	Andrews Road	M-150 to 155th Street	30	0	(a)	NA	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	(a)	NA
	155th Street	US 71 to N Scott Avenue	80	0	40	0	20	0
	Markey Road	N Scott Avenue to M-58	20	0	(a)	NA	(a)	NA
	Westover Road	Markey Road to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	30	0	20	0
	US 71	Highway Y to 155th Street	330	146	160	65	80	0
2004	M-58	US 71 to N Scott Avenue	120	0	60	0	30	0
	M-150	Holmes Road to US 71	130	3	60	0	30	0
	Andrews Road	M-150 to 155th Street	30	0	(a)	NA	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	(a)	NA
	155th Street	US 71 to N Scott Avenue	80	0	40	0	20	0
	Markey Road	N Scott Avenue to M-58	20	0	(a)	NA	(a)	NA
	Westover Road	Markey Road to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	40	0	20	0
	US 71	Highway Y to 155th Street	350	146	170	65	90	0
2014	M-58	US 71 to N Scott Avenue	120	0	60	0	30	0
	M-150	Holmes Road to US 71	180	3	80	0	40	0
	Andrews Road	M-150 to 155th Street	30	0	(a)	NA	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	(a)	NA
	155th Street	US 71 to N Scott Avenue	80	0	40	0	20	0
	Markey Road	N Scott Avenue to M-58	30	0	(a)	NA	(a)	NA
	Westover Road	Markey Road to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	40	0	20	0
	US 71	Highway Y to 155th Street	400	224	190	88	100	0

Note: (a) Contained within roadway.
db = decibel.
DNL = day-night average sound level.
M = Missouri Highway.
NA = Not applicable for this roadway.
US = United States Highway.

Table I-18a. Annual Aircraft Operations for Aviation with Mixed Use Alternative (1999)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			714	1
A-10	250	35		
C-130	141	20		
T-37	132	18		
C-9	29	4		
UH-1N	66	9		
P-3	38	5		
T-34	9	1		
T-44	6	1		
C-12	26	4		
C-21	17	2		
General Aviation			51,001	81
Single Engine Piston	41,310	81		
Beech Baron 58P (twin engine piston)	3,060	6		
Conquest II (turboprop)	3,826	8		
Citation I (corporate jet)	2,040	4		
Helicopter	765	<2		
Flight Training			11,000	18
Single Engine Piston	8,250	75		
Beech Baron 58P (twin engine piston)	2,750	25		
TOTAL			62,715	100

Table I-18b. Annual Aircraft Operations for Aviation with Mixed Use Alternative (2004)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			714	1
A-10	250	35		
C-130	141	20		
T-37	132	18		
C-9	29	4		
UH-1N	66	9		
P-3	38	5		
T-34	9	1		
T-44	6	1		
C-12	26	4		
C-21	17	2		
General Aviation			65,000	80
Single Engine Piston	51,350	79		
Beech Baron 58P (twin engine piston)	3,900	6		
Conquest II (turboprop)	5,038	8		
Citation I (corporate jet)	3,412	5		
Helicopter	1,300	2		
Flight Training			15,200	19
Single Engine Piston	11,400	75		
Beech Baron 58P (twin engine piston)	3,800	25		
TOTAL			80,914	100

Table I-18c. Annual Aircraft Operations for Aviation with Mixed Use Alternative (2014)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			714	<1
A-10	250	35		
C-130	141	20		
T-37	132	18		
C-9	29	4		
UH-1N	66	9		
P-3	38	5		
T-34	9	1		
T-44	6	1		
C-12	26	4		
C-21	17	2		
General Aviation			89,001	84
Single Engine Piston	66,750	75		
Beech Baron 58P (twin engine piston)	5,340	6		
Conquest II (turboprop)	7,343	8		
Citation I (corporate jet)	6,898	8		
Helicopter	2,670	3		
Flight Training			16,700	16
Single Engine Piston	12,525	75		
Beech Baron 58P (twin engine piston)	4,175	25		
TOTAL			106,415	100

Table I-19a. Assignment of Civilian Operations for Aviation with Mixed Use Alternative (1999)

	Departure Flight Tracks															
	D1B		D11		D12		D2B		D13		D14		D3B		D4B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
COMSEP	1.07	0.02	1.07	0.02	1.07	0.02	0.71	0.01	0.71	0.01	0.71	0.01	12.82	0.22	8.55	0.14
Beech Baron 58P	1.58	0.02	1.58	0.02	1.58	0.02	1.05	0.01	1.05	0.01	1.05	0.01	-	-	-	-
Conquest II	1.03	0.02	1.03	0.02	1.03	0.02	0.69	0.01	0.69	0.01	0.69	0.01	-	-	-	-
Citation I	0.55	0.01	0.55	0.01	0.55	0.01	0.37	0.01	0.37	0.01	0.37	0.01	-	-	-	-
B-212[a]	0.21	-	0.21	-	0.21	-	0.14	-	0.14	-	0.14	-	-	-	-	-

	Arrival Flight Tracks								Touch-and-Go Flight Tracks			
	A1B		A2B		A3B		A4B		T1		T2	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
COMSEP	2.14	0.04	3.20	0.05	8.55	0.14	12.82	0.22	24.03	0.41	16.02	0.27
Beech Baron 58P	3.15	0.03	4.73	0.05	-	-	-	-	-	-	-	-
Conquest II	2.06	0.04	3.08	0.06	-	-	-	-	-	-	-	-
Citation I	1.10	0.02	1.64	0.03	-	-	-	-	-	-	-	-
B-212[a]	0.41	0.01	0.62	0.01	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

Table I-19b. Assignment of Civilian Operations for Aviation with Mixed Use Alternative (2004)

	Departure Flight Tracks															
	D1B		D11		D12		D2B		D13		D14		D3B		D4B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
COMSEP	1.35	0.02	1.35	0.02	1.35	0.02	0.90	0.02	0.90	0.02	0.90	0.02	16.23	0.27	10.82	0.18
Beech Baron 58P	2.09	0.02	2.09	0.02	2.09	0.02	1.39	0.01	1.39	0.01	1.39	0.01	-	-	-	-
Conquest II	1.35	0.03	1.35	0.03	1.35	0.03	0.90	0.02	0.90	0.02	0.90	0.02	-	-	-	-
Citation I	0.92	0.02	0.92	0.02	0.92	0.02	0.61	0.01	0.61	0.01	0.61	0.01	-	-	-	-
B-212[a]	0.36	-	0.36	-	0.36	-	0.24	-	0.24	-	0.24	-	-	-	-	-

	Arrival Flight Tracks								Touch-and-Go Flight Tracks			
	A1B		A2B		A3B		A4B		T1		T2	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
COMSEP	2.71	0.05	4.06	0.07	10.82	0.18	16.23	0.27	30.44	0.51	20.29	0.34
Beech Baron 58P	4.18	0.04	6.26	0.06	-	-	-	-	-	-	-	-
Conquest II	2.71	0.06	4.06	0.08	-	-	-	-	-	-	-	-
Citation I	1.83	0.04	2.75	0.06	-	-	-	-	-	-	-	-
B-212[a]	0.70	0.02	1.05	0.02	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

Table I-19c. Assignment of Civilian Operations for Aviation with Mixed Use Alternative (2014)

	Departure Flight Tracks															
	D1B		D11		D12		D2B		D13		D14		D3B		D4B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
COMSEP	1.71	0.03	1.71	0.03	1.71	0.03	1.14	0.02	1.14	0.02	1.14	0.02	20.50	0.35	13.67	0.23
Beech Baron 58P	2.58	0.03	2.58	0.03	2.58	0.03	1.72	0.02	1.72	0.02	1.72	0.02	-	-	-	-
Conquest II	1.97	0.04	1.97	0.04	1.97	0.04	1.31	0.03	1.31	0.03	1.31	0.03	-	-	-	-
Citation I	1.85	0.04	1.85	0.04	1.85	0.04	1.23	0.03	1.23	0.03	1.23	0.03	-	-	-	-
B-212[a]	0.73	-	0.73	-	0.73	-	0.49	-	0.49	-	0.49	-	-	-	-	-

	Arrival Flight Tracks								Touch-and-Go Flight Tracks			
	A1B		A2B		A3B		A4B		T1		T2	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
COMSEP	3.42	0.06	5.12	0.09	13.67	0.23	20.50	0.35	38.44	0.66	25.62	0.44
Beech Baron 58P	5.16	0.06	7.73	0.09	-	-	-	-	-	-	-	-
Conquest II	3.94	0.08	5.91	0.12	-	-	-	-	-	-	-	-
Citation I	3.70	0.08	5.56	0.11	-	-	-	-	-	-	-	-
B-212[a]	1.43	0.03	2.16	0.03	-	-	-	-	-	-	-	-

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

engine piston general aviation operations would be touch-and-go (or closed loop) activities.

A standard 3 degree glide slope and the takeoff profiles provided by the FAA's Integrated Noise Model Database 3.10 were assumed for all civilian aircraft. Glide slopes and takeoff profiles for military aircraft are provided in the NOISEMAP model.

Surface traffic data used in the modeling were developed from the project traffic study and are shown in Table I-12. The traffic mix, day/night split, and speed were assumed to remain the same as for the preclosure reference. Surface traffic noise levels along key road segments are presented in Table I-20 in terms of DNL as a function of distance from the roadway centerline. The number of residences within the DNL 65, 70, and 75 dB levels are also shown. Number of residents impacted were determined from aerial photographs dated June 7 and June 12, 1992, and USGS maps (photorevised in 1970, 1975, 1980, and 1981).

1.6 INDUSTRIAL ALTERNATIVE

The Industrial Alternative for the reuse of Richards-Gebaur AFB would be centered around industrial development and support for a small general aviation airport. As in the Proposed Action, the airfield would be primarily a civilian aviation facility. Primary components of the aviation action include general aviation operations and military transients. Non-aviation uses include industrial, institutional, commercial, residential, public facilities/ recreational, and agricultural uses.

The fleet mix and annual operations for each of the modeled years are contained in Table I-21. The DNL contours for the proposed flight operations are presented in Section 4.4.4 of the main text. The proposed civilian flight tracks modeled are the same as those modeled for Runway 18/36 for the Aviation Alternative (see Figure I-6). The day-night split for all aircraft operations is given in Table I-2. Daily civilian operations assigned to each flight track are provided in Table I-22. Stage lengths for air operations are given in Table I-3. Military flight tracks are shown in Figures I-1 to I-3. Assignment of military operations would be as shown in Table I-15.

No engine runup operations were assumed for the Industrial Alternative.

General aviation operations would be divided into the same five types as in the Aviation Alternative.

A standard 3 degree glide slope and the takeoff profiles provided by the FAA's Integrated Noise Model Database 3.10 were assumed for all civilian aircraft. Glide slopes and takeoff profiles for military aircraft are provided in the NOISEMAP model.

Table I-20. Surface Traffic Operations for Total Traffic Volumes (Preclosure and Closure)

Roadway	From/to	AADT	Speed Assumed (mph)	Road Width Assumed (no. of lanes)	Day/Night Split (percent)	Percentage Trucks Medium/Heavy
Preclosure						
M-58	US 71 to N Scott Avenue	15,500	45	2	88.6/11.4	2.0/3.0
M-150	Holmes Road to US 71	8,590	55	2	88.6/11.4	2.0/1.0
Andrews Road	M-150 to 155th Street	1,480	45	2	90.0/10.0	2.0/1.0
N Scott Avenue	M-58 to Markey Road	10,380	45	2	90.0/10.0	2.0/1.0
155th Street	US 71 to N Scott Avenue	13,000	45	2	88.6/11.4	2.0/1.0
Markey Road	N Scott Avenue to M-58	3,350	35	2	90.0/10.0	2.0/1.0
Westover Road	Markey Road to M-58	1,730	35	2	90.0/10.0	2.0/1.0
Highway Y	M-58 to US 71	6,130	55	2	88.6/11.4	2.0/1.0
US 71	Highway Y to 155th Street	41,450	55	4	87.0/13.0	2.0/3.0
Closure						
M-58	US 71 to N Scott Avenue	15,404	45	2	88.6/11.4	2.0/3.0
M-150	Holmes Road to US 71	8,192	55	2	88.6/11.4	2.0/1.0
Andrews Road	M-150 to 155th Street	1,082	45	2	90.0/10.0	2.0/1.0
N Scott Avenue	M-58 to Markey Road	10,236	45	2	90.0/10.0	2.0/1.0
155th Street	US 71 to N Scott Avenue	12,564	45	2	88.6/11.4	2.0/1.0
Markey Road	N Scott Avenue to M-58	3,350	35	2	90.0/10.0	2.0/1.0
Westover Road	Markey Road to M-58	1,586	35	2	90.0/10.0	2.0/1.0
Highway Y	M-58 to US 71	6,130	55	2	88.6/11.4	2.0/1.0
US 71	Highway Y to 155th Street	41,327	55	4	87.0/13.0	2.0/3.0

AADT = average annual daily traffic.
M = Missouri Highway.
mph = miles per hour.
US = United States Highway.

Table I-21a. Annual Aircraft Operations for Industrial Alternative (1999)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			1,001	2
A-10	250	25		
C-130/141	141	14		
T-37/38	312	31		
UH-1N	66	7		
F-16	39	4		
F-18	11	1		
KC-10	63	6		
C-9	29	3		
P-3	38	4		
T-34	9	1		
T-44	6	<1		
C-12	26	3		
C-21	11	1		
General Aviation			45,000	98
Single Engine Piston	36,000	81		
Beech Baron 58P (twin engine piston)	2,700	6		
Conquest II (turboprop)	3,600	8		
Citation I (corporate jet)	1,800	4		
Helicopter	900	<2		
TOTAL			46,001	100

Table I-21b. Annual Aircraft Operations for Industrial Alternative (2004)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			1,001	2
A-10	250	25		
C-130/141	141	14		
T-37/38	312	31		
UH-1N	66	7		
F-16	39	4		
F-18	11	1		
KC-10	63	6		
C-9	29	3		
P-3	38	4		
T-34	9	1		
T-44	6	<1		
C-12	26	3		
C-21	11	1		
General Aviation			53,000	98
Single Engine Piston	41,870	79		
Beech Baron 58P (twin engine piston)	3,180	6		
Conquest II (turboprop)	4,240	8		
Citation I (corporate jet)	2,650	5		
Helicopter	1,060	2		
TOTAL			54,001	100

Table I-21c. Annual Aircraft Operations for Industrial Alternative (2014)

Type of Aircraft	Number of Operations	Percent of Category	Total for Category	Category Percent of Total
Military			1,001	1
A-10	250	25		
C-130/141	141	14		
T-37/38	312	31		
UH-1N	66	7		
F-16	39	4		
F-18	11	1		
KC-10	63	6		
C-9	29	3		
P-3	38	4		
T-34	9	1		
T-44	6	<1		
C-12	26	3		
C-21	11	1		
General Aviation			75,000	99
Single Engine Piston	56,250	74		
Beech Baron 58P (twin engine piston)	4,500	6		
Conquest II (turboprop)	6,000	8		
Citation I (corporate jet)	6,000	8		
Helicopter	2,250	3		
TOTAL			76,001	100

Table I-22a. Assignment of Civilian Operations for Industrial Alternative (1999)

	Departure Flight Tracks												Arrival Flight Tracks			
	D1B		D11		D12		D2B		D13		D14		A1B		A2B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
COMSEP	9.67	0.20	9.67	0.20	9.67	0.20	6.44	0.13	6.44	0.13	6.44	0.13	19.33	0.39	29.00	0.59
Beech Baron 58P	0.72	0.01	0.72	0.01	0.72	0.01	0.48	0.01	0.48	0.01	0.48	0.01	1.45	0.03	2.17	0.04
Conquest II	0.97	0.02	0.97	0.02	0.97	0.02	0.64	0.01	0.64	0.01	0.64	0.01	1.93	0.04	2.90	0.06
Citation I	0.48	0.01	0.48	0.01	0.48	0.01	0.32	0.01	0.32	0.01	0.32	0.01	0.97	0.02	1.45	0.03
B-212[a]	0.24	-	0.24	-	0.24	-	0.16	-	0.16	-	0.16	-	0.48	0.01	0.72	0.01

Table I-22b. Assignment of Civilian Operations for Industrial Alternative (2004)

	Departure Flight Tracks												Arrival Flight Tracks			
	D1B		D11		D12		D2B		D13		D14		A1B		A2B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
COMSEP	11.24	0.23	11.24	0.23	11.24	0.23	7.49	0.15	7.49	0.15	7.49	0.15	22.48	0.46	33.73	0.69
Beech Baron 58P	0.85	0.02	0.85	0.02	0.85	0.02	0.57	0.01	0.57	0.01	0.57	0.01	1.71	0.04	2.56	0.05
Conquest II	1.14	0.02	1.14	0.02	1.14	0.02	0.75	0.01	0.75	0.01	0.75	0.01	2.27	0.05	3.42	0.07
Citation I	0.71	0.01	0.71	0.01	0.71	0.01	0.47	0.01	0.47	0.01	0.47	0.01	1.43	0.03	2.13	0.04
B-212[a]	0.28	-	0.28	-	0.28	-	0.19	-	0.19	-	0.19	-	0.57	0.01	0.85	0.01

Table I-22c. Assignment of Civilian Operations for Industrial Alternative (2014)

	Departure Flight Tracks												Arrival Flight Tracks			
	D1B		D11		D12		D2B		D13		D14		A1B		A2B	
Aircraft	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
COMSEP	15.10	0.31	15.10	0.31	15.10	0.31	10.07	0.21	10.07	0.21	10.07	0.21	30.21	0.62	45.31	0.92
Beech Baron 58P	1.21	0.02	1.21	0.02	1.21	0.02	0.81	0.02	0.81	0.02	0.81	0.02	2.42	0.05	3.62	0.07
Conquest II	1.62	0.03	1.62	0.03	1.62	0.03	1.07	0.02	1.07	0.02	1.07	0.02	3.22	0.07	4.83	0.10
Citation I	1.60	0.03	1.60	0.03	1.60	0.03	1.07	0.03	1.07	0.03	1.07	0.03	3.23	0.07	4.83	0.10
B-212[a]	0.60	-	0.60	-	0.60	-	0.40	-	0.40	-	0.40	-	1.20	0.03	1.80	0.03

Note: (a) Helicopters, which do not always use flight tracks, were associated with a flight track to allow modeling.

Surface traffic data used in the modeling were developed from the project traffic study and are shown in Table I-12. The traffic mix, day/night split, and speed were assumed to remain the same as for the preclosure reference. Surface traffic noise levels along key road segments are presented in Table I-23 in terms of DNL as a function of distance from the roadway centerline. The number of residents within the DNL 65, 70, and 75 dB are also shown. The number of residents impacted was determined from aerial photographs dated June 7 and June 12, 1992, and USGS maps (photorevised in 1970, 1975, 1980, and 1981).

1.7 NO-ACTION ALTERNATIVE

The No-Action Alternative would result in no further use of the base property regardless of whether or not the Air Force retains ownership of the property after closure. Ongoing aircraft operations at Richards-Gebaur Airport would be similar to those projected for the reuse alternatives, and were not modeled separately. A disposal management team would be provided to ensure base security and maintain the grounds and physical assets, including the existing utilities and structures. There would be no military activities/missions performed on the property identified for disposal. Surface traffic data used in the modeling were developed from the project traffic study and are presented in Table I-12. The traffic mix, day/night split, and speed were assumed to remain the same as for the preclosure reference. Surface traffic noise levels along key road segments are presented in Table I-24 in terms of DNL as a function of distance from the roadway centerline. The number of residents within the DNL 65, 70, and 75 dB levels are also shown. The number of residents impacted was determined from aerial photographs dated June 7 and June 12, 1992, and USGS maps (photorevised in 1970, 1975, 1980, and 1981).

2. NOISE METRICS

Noise, as used in this context, refers to sound pressure variations audible to the ear. The audibility of a sound depends on the amplitude and frequency of the sound and the individual's capability to hear the sound. Whether the sound is judged as noise depends largely on the listener's current activity and attitude toward the sound source, as well as the amplitude and frequency of the sound. The range in sound pressures which the human ear can comfortably detect encompasses a wide range of amplitudes, typically a factor larger than a million. To obtain convenient measurements and sensitivities at extremely low and high sound pressures, sound is measured in units of the dB. The dB is a dimensionless unit related to the logarithm of the ratio of the measured level to a reference level.

Because dB is a logarithmic measure, sound levels cannot be added or subtracted directly. However, the following shortcut method can be used to combine sound levels:

Table I-23 Distance to DNL from Roadway Centerline - Industrial Alternative

			DNL 65dB		DNL 70dB		DNL 75dB	
Year	Roadway	Segment	Distance (feet)	Number of Residents	Distance (feet)	Number of Residents	Distance (feet)	Number of Residents
1999	M-58	US 71 to N Scott Avenue	120	0	50	0	30	0
	M-150	Holmes Road to US 71	100	0	50	0	30	0
	Andrews Road	M-150 to 155th Street	20	0	(a)	NA	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	(a)	NA
	155th Street	US 71 to N Scott Avenue	80	0	40	0	20	0
	Markey Road	N Scott Avenue to M-58	20	0	(a)	NA	(a)	NA
	Westover Rd	Markey Rd to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	30	0	20	0
	US 71	Highway Y to 155th Street	330	146	160	65	80	0
2004	M-58	US 71 to N Scott Avenue	120	0	60	0	30	0
	M-150	Holmes Road to US 71	130	3	60	0	30	0
	Andrews Road	M-150 to 155th Street	30	0	(a)	NA	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	(a)	NA
	155th Street	US 71 to N Scott Avenue	80	0	40	0	20	0
	Markey Road	N Scott Avenue to M-58	20	0	(a)	NA	(a)	NA
	Westover Road	Markey Road to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	40	0	20	0
	US 71	Highway Y to 155th Street	350	146	170	65	90	0
2014	M-58	US 71 to N Scott Avenue	120	0	60	0	30	0
	M-150	Holmes Road to US 71	180	3	80	0	40	0
	Andrews Road	M-150 to 155th Street	30	0	(a)	NA	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	(a)	NA
	155th Street	US 71 to N Scott Avenue	80	0	40	0	20	0
	Markey Road	N Scott Avenue to M-58	30	0	(a)	NA	(a)	NA
	Westover Road	Markey Road to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	40	0	20	0
	US 71	Highway Y to 155th Street	400	224	190	88	100	0

Note: (a) Contained within roadway.
db = decibel.
DNL = day-night average sound level.
M = Missouri Highway.
NA = Not applicable for this roadway.
US = United States Highway.

Table I-24. Distance to DNL from Roadway Centerline - No-Action Alternative

			DNL 65dB		DNL 70dB		DNL 75dB	
Year	Roadway	Segment	Distance (feet)	Number of Residents	Distance (feet)	Number of Residents	Distance (feet)	Number of Residents
1999	M-58	US 71 to N Scott Avenue	120	0	50	0	30	0
	M-150	Holmes Road to US 71	100	0	50	0	(a)	NA
	Andrews Road	M-150 to 155th Street	20	0	(a)	NA	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	(a)	NA
	155th Street	US 71 to N Scott Avenue	80	0	40	0	20	0
	Markey Road	N Scott Avenue to M-58	20	0	(a)	NA	(a)	NA
	Westover Road	Markey Road to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	30	0	20	0
	US 71	Highway Y to 155th Street	330	146	160	65	80	0
2004	M-58	US 71 to N Scott Avenue	120	0	60	0	30	0
	M-150	Holmes Road to US 71	120	0	60	0	30	0
	Andrews Road	M-150 to 155th St	20	0	(a)	NA	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	(a)	NA
	155th Street	US 71 to N Scott Avenue	80	0	40	0	20	0
	Markey Road	N Scott Avenue to M-58	20	0	(a)	NA	(a)	NA
	Westover Road	Markey Road to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	40	0	20	0
	US 71	Highway Y to 155th Street	350	146	170	65	90	0
2014	M-58	US 71 to N Scott Avenue	120	0	60	0	30	0
	M-150	Holmes Road to US 71	170	3	800	0	40	0
	Andrews Road	M-150 to 155th Street	20	0	(a)	NA	(a)	NA
	N Scott Avenue	M-58 to Markey Road	70	0	30	0	(a)	NA
	155th Street	US 71 to N Scott Avenue	80	0	40	0	20	0
	Markey Road	N Scott Avenue to M-58	30	0	(a)	NA	(a)	NA
	Westover Road	Markey Road to M-58	20	0	(a)	NA	(a)	NA
	Highway Y	M-58 to US 71	70	0	40	0	20	0
	US 71	Highway Y to 155th Street	400	224	190	88	100	0

Note: (a) Contained within roadway.
db = decibel.
DNL = day-night average sound level.
M = Missouri Highway.
NA = Not applicable for this roadway.
US = United States Highway.

Difference between two dB values	Add the following to the higher level
0 to 1	3
2 to 3	2
4 to 9	1
10 or more	0

The ear is not equally sensitive at all frequencies of sound. At low frequencies, characterized as a rumble or roar, the ear is not very sensitive while at higher frequencies, characterized as a screech or a whine, the ear is most sensitive. The A-weighted level was developed to measure and report sound levels in a way which would more closely approach how people perceive the sound. All sound levels reported herein are in terms of A-weighted sound levels.

Environmental sound levels typically vary with time. This is especially true for areas near airports where noise levels will increase substantially as the aircraft passes overhead and afterwards diminish to typical community levels. Both the Department of Defense (DOD) and the FAA have specified the following three noise metrics to describe aviation noise.

Day-Night Average Sound Level (DNL) is the 24-hour energy average A-weighted sound level with a 10 dB weighting added to those levels occurring between 10 p.m. and 7 a.m. the following morning. The 10 dB weighting is a penalty representing the added intrusiveness of noise during normal sleeping hours. DNL is used to determine land use compatibility with noise from aircraft and surface traffic.

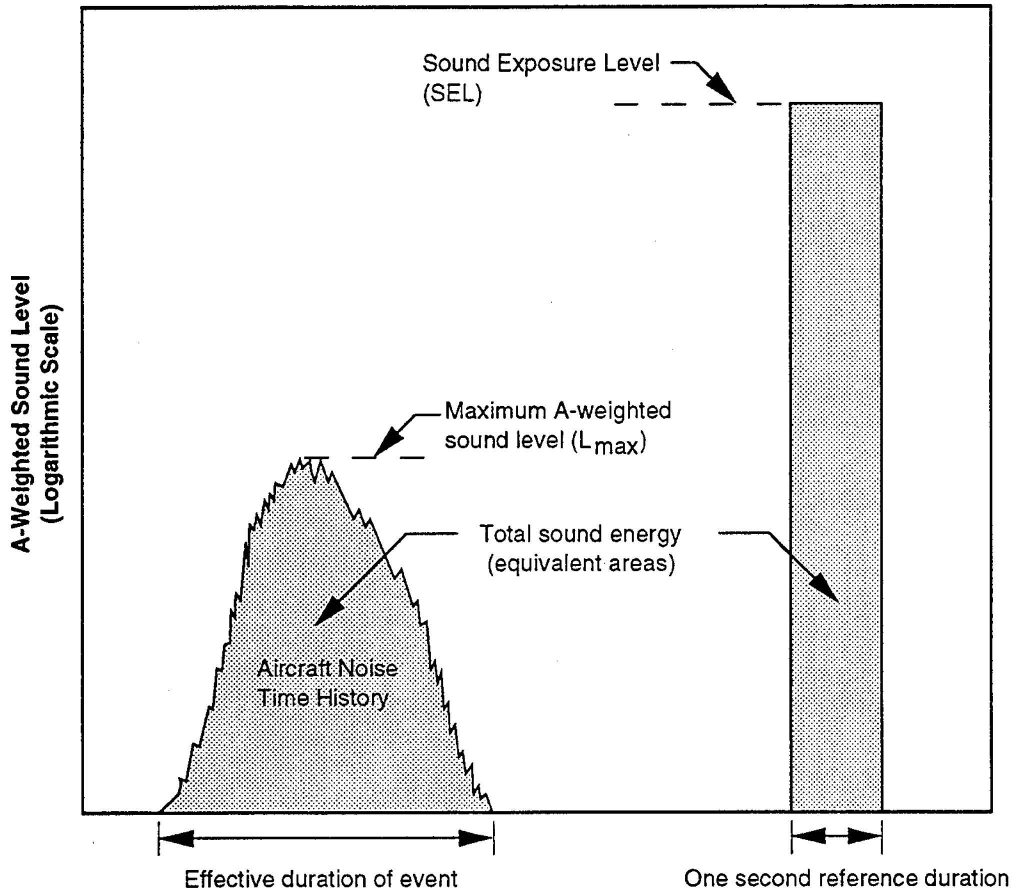
Maximum Sound Level is the highest instantaneous sound level observed during a single noise event no matter how long the sound may persist (see Figure I-7).

Sound Exposure Level (SEL) value represents the A-weighted sound level integrated over the entire duration of the event and referenced to a duration of 1 second. Hence, it normalizes the event to a 1-second event. Typically, most events (aircraft flyover) last longer than 1 second, and the SEL value will be higher than the maximum sound level of the event. Figure I-7 illustrates the relationship between the maximum sound level and SEL.

3. NOISE MODELS

3.1 AIR TRAFFIC

The Air Force-developed and FAA-approved NOISEMAP, Version 6.1 (Moulton, 1990), was used to predict aircraft noise levels. Since the early 1970s, DOD has been actively developing and refining the NOISEMAP program and its associated data base. The NOISEMAP computer program is



Sound Exposure Level (SEL)

Figure I-7

a comprehensive set of computer routines for calculating noise contours from aircraft flight and ground runup operations, using aircraft unique noise data for both fixed- and rotary-wing aircraft. The program requires specific input data, consisting of runway layout, aircraft types, number of operations, flight tracks, and noise performance data, to compute a grid of DNL values at uniform intervals.

The grid is then processed by a contouring program, which draws the contours at selected intervals.

3.2 SURFACE TRAFFIC

The FHWA Highway Traffic Noise Prediction Noise Model was used to predict surface traffic noise. The model uses traffic volumes, vehicular mix, traffic speed, traffic distribution, and roadway length to estimate traffic noise levels.

4. ASSESSMENT CRITERIA

Criteria for assessing the effects of noise include annoyance, speech interference, sleep disturbance, noise-induced hearing loss, possible nonauditory health effects, reaction by animals, and land use compatibility. These criteria are often developed using statistical methods. The validity of generalizing statistics devised from large populations is suspect when applied to small sample sizes as we have in the affected areas near Richards-Gebaur AFB. Caution should be employed when interpreting the results of the impact analysis.

4.1 ANNOYANCE DUE TO SUBSONIC AIRCRAFT NOISE

Noise-induced annoyance is an attitude or mental process with both acoustic and nonacoustic determinants (Fidell et al., 1988). Noise-induced annoyance is perhaps most often defined as a generalized adverse attitude toward noise exposure. Noise annoyance is affected by many factors including sleep and speech interference and task interruption. The level of annoyance may also be affected by many non-acoustic factors.

In communities in which the prevalence of annoyance is affected primarily by noise, reductions in exposure can be expected to lead to reductions in prevalence of annoyance. In communities in which the prevalence of annoyance is controlled by nonacoustic factors, such as odor, traffic congestion, etc., there may be little or no reduction in annoyance associated with reductions in exposure. The intensity of community response to noise exposure may even, in some cases, be essentially independent of physical exposure. In the case of community response to actions, such as airport siting or scheduling of supersonic transport aircraft, vigorous reaction has

been encountered at the mere threat of exposure, or minor increases in exposure.

The standard method for determining the prevalence of annoyance in noise-exposed communities is by attitudinal survey. Surveys generally solicit self-reports of annoyance through one or more questions of the form "How bothered or annoyed have you been by the noise of (noise source) over the last (time period)?" Respondents are typically constrained in structured interviews to select one of a number of response alternatives, often named categories such as "Not At All Annoyed," "Slightly Annoyed," "Moderately Annoyed," "Very Annoyed," or "Extremely Annoyed." Other means are sometimes used to infer the prevalence of annoyance from survey data (for example, by interpretation of responses to activity interference questions or by construction of elaborate composite indices), with varying degrees of face validity and success.

Predictions of the prevalence of annoyance in a community can be made by extrapolation from an empirical dosage-effect relationship. Based on the results of a number of sound surveys, Schultz (1978) developed a relationship between percent highly annoyed and DNL:

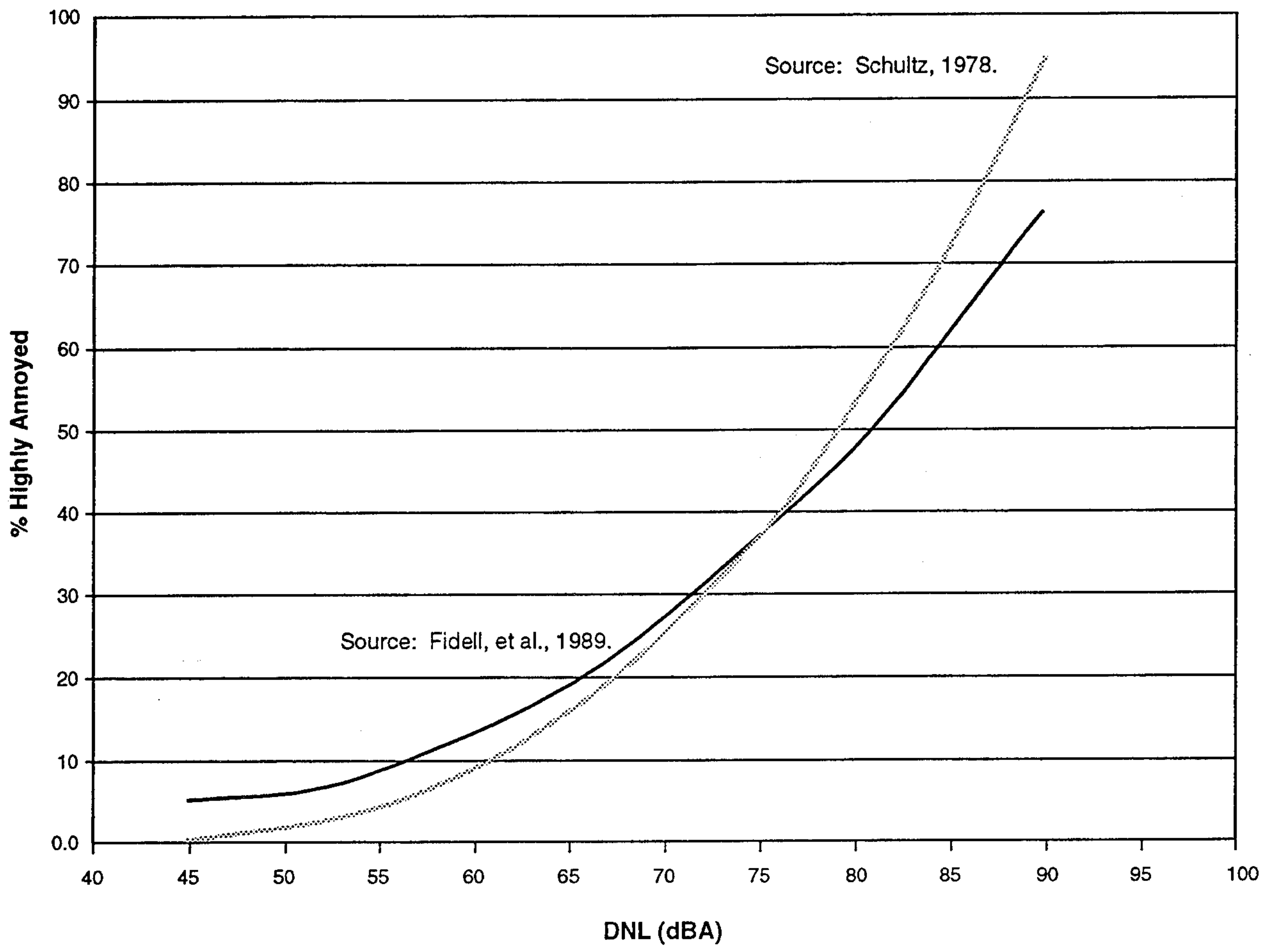
$$\%\ \mathit{Highly\ Annoyed} = 0.8553\ \mathit{DNL} - 0.0401\ \mathit{DNL}^2 + 0.00047\ \mathit{DNL}^3$$

Note that this relationship should not be evaluated outside the range of DNL = 45 to 90 dB. Figure I-8 presents this equation graphically. Less than 15 to 20 percent of the population would be predicted to be annoyed by DNL values less than 65 dB, whereas over 37 percent of the population would be predicted to be annoyed from DNL values greater than 75 dB. The relationship developed by Schultz was presented in the Guidelines for Preparing Environmental Impact Statements on Noise (National Academy of Sciences, 1977).

These results were recently reviewed (Fidell et al., 1989) and the original findings updated with results of more recent social surveys, bringing the number of data points used in defining the relationship to over 400. The findings of the new study differ only slightly from those of the original study.

4.2 SPEECH INTERFERENCE AND RELATED EFFECTS DUE TO AIRCRAFT FLYOVER NOISE

One of the ways that noise affects daily life is by preventing or impairing speech communication. In a noisy environment, understanding of speech is diminished by masking of speech signals by intruding noises. Speakers generally raise their voices or move closer to listeners to compensate for



Community Noise Annoyance Curves

Figure I-8

masking noise in face-to-face communications, thereby increasing the level of speech at the listener's ear. As intruding noise levels rise higher and higher, speakers may cease talking altogether until conversation can be resumed at comfortable levels of vocal effort after noise intrusions end.

If the speech source is a radio or television, the listener may increase the volume during a noise intrusion. If noise intrusions occur repeatedly, the listener may choose to set the volume at a high level so that the program material can be heard even during noise intrusions.

In addition to losing information contained in the masked speech material, the listener may lose concentration because of the interruptions and thus become annoyed. If the speech message is some type of warning, the consequences could be serious.

Current practice in quantification of the magnitude of speech interference and predicting speech intelligibility ranges from metrics based on A-weighted sound pressure levels of the intruding noise alone to more complex metrics requiring detailed spectral information about both speech and noise intrusions. There are other effects of the reduced intelligibility of speech caused by noise intrusions. For example, if the understanding of speech is interrupted, performance may be reduced, annoyance may increase, and learning may be impaired.

As the noise level of an environment increases, people automatically raise their voices. The effect does not take place, however, if the noise event were to rise to a high level very suddenly.

4.2.1 Speech Interference Effects from Time-Varying Noise

Most research on speech interference due to noise has included the study of steady state noise. As a result, reviews and summaries of noise effects on speech communications concentrate on continuous or at least long duration noises (Miller, 1974). However, noise intrusions are not always continuous or of long duration, but are frequently transient in nature. Transportation noise generates many such noise intrusions, consisting primarily of individual vehicle pass-bys, such as aircraft flyovers. Noise emitted by other vehicles (motorboats, snowmobiles, and off-highway vehicles) is also transient in nature.

It has been shown, at least for aircraft flyover noise, that accuracy of predictors of speech intelligibility are ranked in a similar fashion for both steady state and time-varying or transient sounds (Kryter and Williams, 1966; Williams et al., 1971). Of course, if one measures the noise of a flyover by the maximum A-weighted level then intelligibility associated with this level would be higher than for a steady noise of the same value, simply

because the level is less than the maximum for much of the duration of the flyover.

4.2.2 Other Effects of Noise Which Relate to Speech Intelligibility

Aside from the direct effects of reduction in speech intelligibility, related effects may occur that tend to compound the loss of speech intelligibility itself.

Learning. One of the environments in which speech intelligibility plays a critical role is the classroom. In classrooms of schools exposed to aircraft flyover noise, speech becomes masked or the teacher stops talking altogether during an aircraft flyover (Crook and Langdon, 1974). Pauses begin to occur when instantaneous flyover levels exceed 60 dB. Masking of the speech of teachers who do not pause starts at about the same level.

At levels of 75 dB some masking occurs for 15 percent of the flyovers and increases to nearly 100 percent at 82 dB. Pauses occur for about 80 percent of the flyovers at this noise level. Since a marked increase in pauses and masking occurs when levels exceed 75 dB, this level is sometimes considered as one above which teaching is impaired due to disruption of speech communication. The effect that this may have on learning is unclear at this time. However, one study (Arnoult et al., 1986) could find no effect of noise on cognitive tasks from jet or helicopter noise over a range from 60 to 80 dB (A-level), even though intelligibility scores indicated a continuous decline starting at the 60 dB level. In a Japanese study (Ando et al., 1975) researchers failed to find differences in mental task performance among children from communities with different aircraft noise exposure.

Although there seems to be no proof that noise from aircraft flyovers affects learning, it is reported by Mills (1975) that children are not as able to understand speech in the presence of noise as are adults. It is hypothesized that part of the reason is due to the increased vocabulary which the adult can draw on as compared to the more limited vocabulary available to the young student. Also, when one is learning a language, it is more critical that all words be heard rather than only enough to attain 95 percent sentence intelligibility, which may be sufficient for general conversations. It was mentioned above that when the maximum A-level for aircraft flyovers heard in a classroom exceeds 75 dB, masking of speech increases rapidly. However, it was also noted that pausing during flyovers and masking of speech for those teachers who continue to lecture during a flyover start at levels around 60 dB (Pearsons and Bennett, 1974).

Animals. Literature concerning the effects of noise on animals is not large, and most of the studies have focused on the relation between dosages of continuous noise and effects (Ames, 1974; Belanovskii and Omel'yanenko,

1982). A literature survey (Kull and Fisher, 1986) found that the literature is inadequate to document long-term or subtle effects of noise on animals. No controlled study has documented any serious accident or mortality on livestock despite extreme exposure to noise.

Annoyance. Klatt, Stevens, and Williams (1969) studied the annoyance of speech interference by asking people to judge the annoyance of aircraft noise in the presence and absence of speech material. The speech material was composed of passages from newspaper and magazine articles. In addition to rating aircraft noise on an acceptability scale (unacceptable, barely acceptable, acceptable, and of no concern), the subjects were required to answer questions about the speech material. The voice level was considered to represent a raised voice level (assumed to be 68 dB). In general, for the raised voice talker, the rating of barely acceptable was given to flyover noise levels of 73 to 76 dB. However, if the speech level was reduced, the rating of the aircraft tended more toward unacceptable. The results suggested that if the speech level were such that 95 percent or better sentence intelligibility was maintained, then a barely acceptable rating or better acceptability rating could be expected. This result is in general agreement with the finding in schools that teachers pause or have their speech masked at levels above 75 dB (Crook and Langdon, 1974).

Hall, Taylor, and Birnie (1985) recently tried to relate various types of activity interference in the home, related to speech and sleeping, to annoyance. The study found that there is a 50 percent chance that people's speech would be interfered with at a level of 58 dB. This result is in agreement with the other results, considering that the speech levels in the school environment of the Cook study are higher than the levels typically used in the home. Also, in a classroom situation the teacher raises his or her voice as the flyover noise increases in intensity.

4.2.3 Predicting Speech Intelligibility and Related Effects Due to Aircraft Flyover Noise

It appears, from the above discussions, that when aircraft flyover noises exceed approximately 60 dB, speech communication may be interfered with either by masking or by pausing on the part of the talker. Increasing the level of the flyover noise to 80 dB would reduce the intelligibility to zero even if a loud voice is used by those attempting to communicate.

The levels mentioned above refer to noise levels measured indoors. The same noises measured outdoors would be 15 to 25 dB higher than these indoor levels during summer (windows open) and winter months (windows closed), respectively. These estimates are taken from U.S. Environmental Protection Agency (EPA) reviews of available data (U.S. EPA, 1974).

Levels of the aircraft noise measured inside dwellings and schools near the ends of runways at airports may exceed 60 dB inside (75 dB outside). During flyovers, speech intelligibility would be degraded. However, since the total duration is short, no more than a few seconds during each flyover, only a few syllables may be lost. People may be annoyed, but the annoyance may not be due to loss in speech communication, but rather due to startle or sleep disturbance as discussed below.

4.3 SLEEP DISTURBANCE DUE TO NOISE

The effects of noise on sleep have long been a concern of parties interested in assuring suitable residential noise environments. Early studies noted background levels in people's bedrooms in which sleep was apparently undisturbed by noise. Various levels between 25 to 50 dB were observed to be associated with an absence of sleep disturbance. The bulk of the research on noise effects on which the current relationship is based was conducted in the 1970s. The tests were conducted in a laboratory environment in which awakening was measured either by a verbal response or by a button push, or by brain wave recordings (EEG) indicating stages of sleep (and awakening). Various types of noise were presented to the sleeping subjects throughout the night. These noises consisted primarily of transportation noises including those produced by aircraft, trucks, cars and trains. The aircraft noises included both flyover noises as well as sonic booms. Synthetic noises, including laboratory-generated sounds consisting of shaped noises and tones, were also studied.

Lukas (1975) and Goldstein and Lukas (1980) both reviewed data available in the 1970s on sleep-stage changes and waking effects of different levels of noise. Since no known health effects were associated with either waking or sleep-stage changes, either measure was potentially useful as a metric of sleep disturbance. However, since waking, unlike sleep-stage changes, is simple to quantify, it is often selected as the metric for estimating the effects of noise on sleep. These two reviews showed great variability in the percentage of people awakened by exposure to noise. The variability is not merely random error, but reflects individual differences in adaptation or habituation, and also interpretation of the meaning of the sounds. Such factors cannot be estimated from the purely acoustic measures in noise exposure.

Another major review, by Griefahn and Muzet (1978), provided similar information for effects of noise on waking. However, Griefahn and Muzet's results suggested less waking for a given level of noise than predicted by Lukas.

A recent review (Pearsons et al., 1989) of the literature related to sleep disturbance demonstrated that the relationship, based exclusively on laboratory studies, predicts greater sleep disturbance than that likely to

occur in a real-life situation in which some adaptation has occurred. The prediction relationships developed in this review should not be considered to yield precise estimates of sleep disturbance because of the great variability in the data sets from which they were developed. The relationships include only the duration and level components of "noise exposure." Increasing the precision of prediction would depend on quantification of some of the nonacoustic factors. Further, a recent review of field, as well as laboratory studies, suggests that habituation may reduce the effect of noise on sleep (Pearsons et al., 1989).

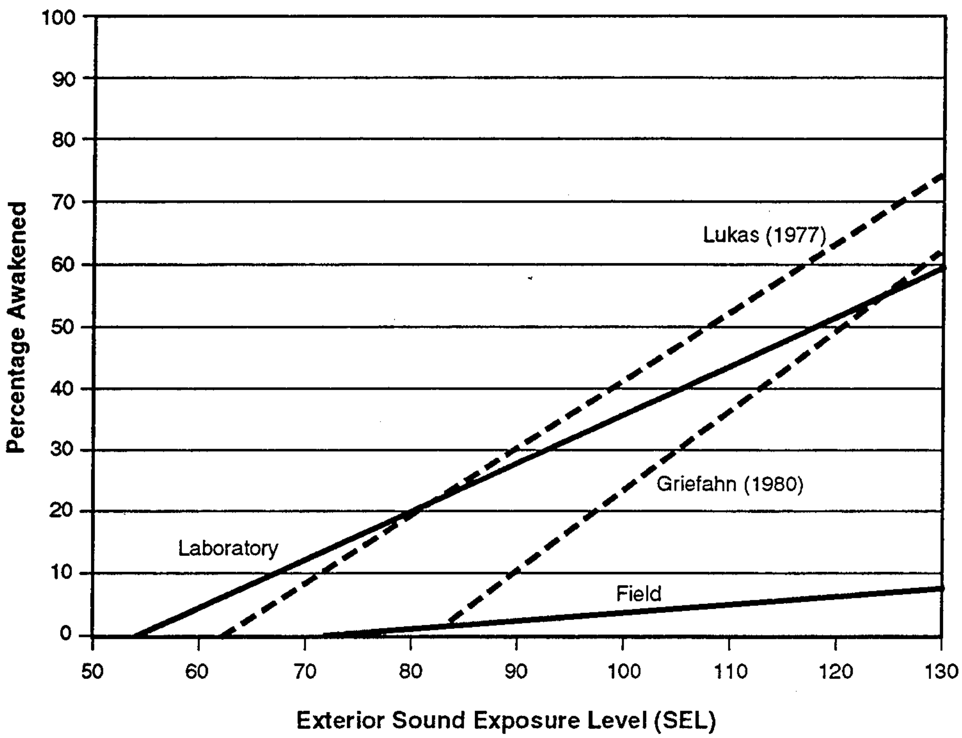
Noise must penetrate the home to disturb sleep. Interior noise levels are lower than exterior levels due to the attenuation of the sound energy by the structure. The amount of attenuation provided by the building is dependent on the type of construction and whether the windows are open or closed. The approximate national average attenuation factors are 15 dB for open windows and 25 dB for closed windows (U.S. EPA, 1974).

Incorporating these attenuation factors, the percent awakened relationships previously discussed under summer conditions are presented in Figure I-9. In conclusion, the scientific literature does not provide a consensus on sleep disturbance. There is no recognized criteria or standard that provides guidance to assess sleep disturbance due to noise.

4.4 NOISE-INDUCED HEARING LOSS

Hearing loss is measured in decibels and refers to the permanent auditory threshold shift of an individual's hearing in an ear. Auditory threshold refers to the minimum acoustic signal that evokes an auditory sensation, i.e., the quietest sound a person can hear. When a threshold shift occurs a person's hearing is not as sensitive as before and the minimum sound that a person can hear must be louder. The threshold shift which naturally occurs with age is called presbycusis. Exposure to high levels of sound can cause temporary and permanent threshold shifts usually referred to as noise-induced hearing loss. Permanent hearing loss is generally associated with destruction of the hair cells of the inner ear.

The U.S. EPA (1974) and the Committee on Hearing, Bioacoustics, and Biomechanics (National Academy of Sciences, 1981) have addressed the risk of outdoor hearing loss. They have concluded that hearing loss would not be expected for people living outside the noise contour of 75 DNL. Several studies of populations near existing airports in the U.S. and the United Kingdom have shown that the possibility for permanent hearing loss in communities near intense commercial take-off and landing patterns is remote. An FAA-funded study compared the hearing of the population near the Los Angeles International Airport to that of the population in a quiet area away from aircraft noise (Parnel et al., 1972). A similar study was performed in the vicinity of London Heathrow Airport (Ward et al., 1972).



Source: Pearsons, et al.,1989

Sleep Disruption (Awakening)

Figure I-9

Both studies concluded that there was no significant difference between the hearing loss of the two populations, and no correlation between the hearing level with the length of time people lived in the airport neighborhood.

4.5 NONAUDITORY HEALTH EFFECTS OF RESIDENTIAL AIRCRAFT NOISE

Based on summaries of previous research in the field (Thompson, 1981; Thompson and Fidell, 1989), predictions of nonauditory health effects of aircraft noise cannot be made. A valid predictive procedure requires: (1) evidence for causality between aircraft noise exposure and adverse nonauditory health consequences, and (2) knowledge of a quantitative relationship between amounts of noise exposure (dose) and specific health effects. Because results of studies of aircraft noise on health are equivocal, there is no sound scientific basis for making adequate risk assessments.

Alleged nonauditory health consequences of aircraft noise exposure which have been studied include birth defects, low birth weight, psychological illness, cancer, stroke, hypertension, sudden cardiac death, myocardial infarction, and cardiac arrhythmias. Of these, hypertension is the most biologically plausible effect of noise exposure. Noise appears to cause many of the same biochemical and physiological reactions, including temporary elevation of blood pressure, as do many other environmental stressors. These temporary increases in blood pressure are believed to lead to a gradual resetting of the body's blood pressure control system. Over a period of years, permanent hypertension may develop (Peterson et al., 1984).

Studies of residential aircraft noise have produced contradictory results. Early investigations indicated that hypertension was from two to four times higher in areas near airports than in areas located away from airports (Karagodina et al., 1969). Although Meecham and Shaw (1988) continue to report excessive cardiovascular mortality among individuals 75 years or older living near the Los Angeles International Airport, their findings cannot be replicated (Frerichs et al., 1980). In fact, noise exposure increased over the years while there was a decline in all cause, age-adjusted death rates and inconsistent changes in age-adjusted cardiovascular, hypertension, and cerebrovascular disease rates.

Studies which have controlled for multiple factors have shown no, or a very weak, association between noise exposure and nonauditory health effects. This observation holds for studies of occupational and traffic noise as well as for aircraft noise exposure. In contrast to the early reports of two- to six-fold increases in hypertension due to high industrial noise (Thompson and Fidell, 1989), the more rigorously controlled studies of Talbott et al. (1985), and van Dijk et al. (1987), show no association between hypertension and prolonged exposure to high levels of occupational noise.

In the aggregate, studies indicate no association exists between street traffic noise and blood pressure or other cardiovascular changes. Two large prospective collaborative studies of heart disease are of particular interest. To date, cross-sectional data from these cohorts offer contradictory results. Data from one cohort show a slight increase in mean systolic blood pressure (2.4 mm Hg) in the noisiest compared to the quietest area; while data from the second cohort show the lowest mean systolic blood pressure and highest high-density lipoprotein cholesterol (lipoprotein protective of heart disease) for men in the noisiest area (Babisch and Gallacher, 1990). These effects of traffic noise on blood pressure and blood lipids were more pronounced in men who were also exposed to high levels of noise at work.

It is clear from the foregoing that the current state of technical knowledge cannot support inference of a causal or consistent relationship, nor a quantitative dose-response, between residential aircraft noise exposure and health consequences. Thus, no technical means are available for predicting extra-auditory health effects of noise exposure. This conclusion cannot be construed as evidence of no effect of residential aircraft noise exposure on nonauditory health. Current findings, taken in sum, indicate only that further rigorous studies are needed.

4.6 DOMESTIC ANIMALS AND WILDLIFE

A recent study was published on the effects of aircraft noise on domestic animals that provided a review of the literature and a review of 209 claims pertinent to aircraft noise over a period spanning 32 years (Bowles et al., 1990). Studies since the late 1950s were motivated both by public concerns about what was at that time a relatively novel technology, supersonic flight, and by claims leveled against the U. S. Air Force for damage done to farm animals by very low-level subsonic overflights. Since that time over 40 studies of aircraft noise and sonic booms, both in the U.S. and overseas, have addressed acute effects, including effects of startle responses (sheep, horses, cattle, fowl), and effects on reproduction and growth (sheep, cattle, fowl, swine), parental behaviors (fowl, mink), milk letdown (dairy cattle, dairy goats, swine), and egg production.

The literature on the effects of noise on domestic animals is not large, and most of the studies have focused on the relation between dosages of continuous noise and effects. Chronic noises are not a good model for aircraft noise, which lasts only a few seconds, but which is often very startling. The review of claims suggest that a major source of loss was panics induced in naive animals.

Aircraft noise may have effects because it might trigger a startle response, a sequence of physiological and behavioral events that once helped animals avoid predators. There are good dose-response relations describing the

tendency to startle to various levels of noise, and the effect of habituation on the startle response.

The link between startles and serious effects, i.e., effects on productivity, is less certain. Here, we will define an effect as any change in a domestic animal that alters its economic value, including changes in body weight or weight gain, numbers of young produced, weight of young produced, fertility, milk production, general health, longevity, or tractability. At this point, changes in productivity are usually considered an adequate indirect measure of changes in well being, at least until objective legal guidelines are provided.

Recent focus on the effects on production runs counter to a trend in the literature toward measuring the relation between noise and physiological effects, such as changes in corticosteroid levels, and in measures of immune system function. As a result, it is difficult to determine the relation between dosages of noise and serious effects using only physiological measures. The experimental literature is inadequate to document long-term or subtle effects resulting from exposure to aircraft noise.

4.7 LAND USE COMPATIBILITY GUIDELINES

Widespread concern about the noise impacts of aircraft noise essentially began in the 1950s which saw the major introduction of high power jet aircraft into military service. The concern about noise impacts in the communities around air bases, and also within the air bases themselves, led the Air Force to conduct major investigations into the noise properties of jets, methods of noise control for test operations, and the effects of noise from aircraft operations in communities surrounding air bases. These studies established an operational framework of investigation and identified the basic parameters affecting community response to noise. These studies also resulted in the first detailed procedures for estimating community response to aircraft noise (Stevens and Pietrasanta, 1957).

Although most attention was given to establishing methods of estimating residential community response to noise (and establishing the conditions of noise "acceptability" for residential use), community development involves a variety of land uses with varying sensitivity to noise. Thus, land planning with respect to noise requires the establishment of noise criteria for different land uses. This need was met with the initial development of aircraft noise compatibility guidelines for varied land uses in the mid-1960s (Bishop, 1964).

In residential areas, noise intrusions generate feelings of annoyance on the part of individuals. Increasing degrees of annoyance lead to the increasing potential for complaints and community actions (most typically, threats of legal actions, drafting of noise ordinances, etc.). Annoyance is based largely

upon noise interference with speech communication, listening to radio and television, and sleep. Annoyance in the home may also be based upon dislike of "outside" intrusions of noise even though no specific task is interrupted.

Residential land use guidelines have developed from consideration of two related factors:

(a) Accumulated case history experience of noise complaints and community actions near civil and military airports

(b) Relationships between environmental noise levels and degrees of annoyance (largely derived from social surveys in a number of communities).

In the establishment of land use guidelines for other land uses, the prime consideration is task interference. For many land uses, this translates into the degree of speech interference, after taking into consideration the importance of speech communication and the presence of non-aircraft noise sources related directly to the specific land use considered. For some noise-sensitive land uses where any detectable noise signals which rise above the ambient noise are unwanted (such as music halls), detectability may be the criterion rather than speech interference.

A final factor to be considered in all land uses involving indoor activities is the degree of noise insulation provided by the building structures. The land use guideline limits for unrestricted development within a specific land use assume noise insulation properties provided by typical commercial building construction. The detailed land use guidelines may also define a range of higher noise exposure where construction or development can be undertaken, provided a specified amount of noise insulation is included in the buildings. Special noise studies, undertaken by architectural or engineering specialists, may be needed to define the special noise insulation requirements for construction in these guideline ranges.

Estimates of total noise exposure resulting from aircraft operations, as expressed in DNL values, can be interpreted in terms of the probable effect on land uses. Suggested compatibility guidelines for evaluating land uses in aircraft noise exposure areas were originally developed by the FAA as presented in Section 3.4.4, Noise. Part 150 of the FAA regulations prescribes the procedures, standards, and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs. It prescribes the use of yearly DNL in the evaluation of airport noise environments. It also identifies those land use types that are normally compatible with various levels of noise exposure. Compatible or incompatible land use is determined by comparing the predicted or measured DNL level at a site with the values given in the table.

The guidelines reflect the statistical variability of the responses of large groups of people to noise. Therefore, any particular level might not accurately assess an individual's perception of an actual noise environment.

While the FAA guidelines specifically apply to aircraft noise, it should be noted that DNL is also used to describe the noise environment due to other community noise sources, including motor vehicles and railroads. The use of DNL is endorsed by the scientific community to assess land use compatibility as it pertains to noise (American National Standards Institute, 1990). Hence, the land use guidelines presented by the FAA can also be used to assess the noise impact from community noise sources other than aircraft.

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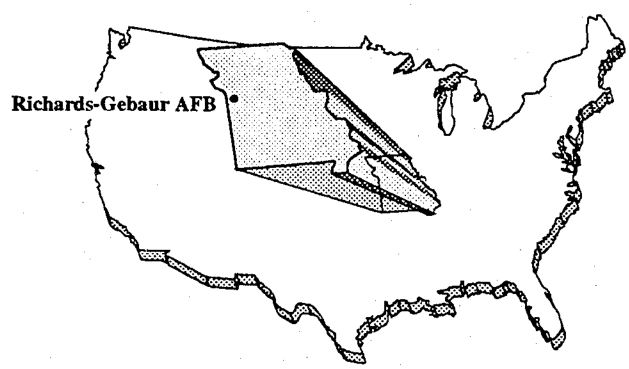

APPENDIX J

APPENDIX J

AIR QUALITY ANALYSIS METHODS

APPENDIX J

AIR QUALITY ANALYSIS METHODS

Construction Emissions. Construction activities would generate both combustive emissions from heavy equipment usage and fugitive dust emissions from ground disturbing activities. Fugitive dust would be generated during construction activities associated with aviation support, industrial, institutional, residential, public facilities/recreation, and agricultural land uses. These emissions would be greatest during site clearing and grading activities. Uncontrolled fugitive dust (particulate matter) emissions from ground-disturbing activities are emitted at a rate of 110 pounds per acre per day (U.S. Environmental Protection Agency [EPA], 1985). The particulate matter equal to or less than 10 microns in diameter (PM_{10}) is the criterion pollutant. The PM_{10} portion of fugitive dust emissions is assumed to be 50 percent, or 55 pounds per acre per working day.

Construction for the Aviation Alternative would disturb a total of approximately 70 acres over the first 10-year period of reuse. Approximately 38 and 32 acres would be disturbed during the periods from 1994-1999 and 1999-2004, respectively. Assuming that the amount of disturbed area is spread evenly throughout these periods, an average of 7.6 and 6.4 acres per year, respectively, would be disturbed during these time periods. The analysis of fugitive dust emissions from construction activities assumes that, on the average, there are 230 working days per year (accounting for weekends, weather, and holidays), and that half of these days (115) would be used for site preparation. Additionally, 4 acre-days of disturbance are assumed per acre, which represents the area and duration of disturbing activities for each acre. Thus, for the Aviation Alternative years 1994-1999, the amount of PM_{10} emissions are calculated as follows:

Average daily disturbed acreage:

$$\frac{\text{7.6 acres disturbed}}{\text{year}} \times \frac{\text{4 acre-days of disturbance}}{\text{acre}} \times \frac{\text{1 year}}{\text{115 days}} = \text{0.264 acre}$$

Average daily PM_{10} emissions:

$$\text{0.264 acre} \times \frac{\text{55 pounds PM}_{10}}{\text{acre-day}} = \frac{\text{14.54 pounds PM}_{10}}{\text{day}}$$

Total annual PM_{10} emissions:

$$\frac{\text{14.54 pounds PM}_{10}}{\text{day}} \times \frac{\text{115 days}}{\text{year}} \times \frac{\text{ton}}{\text{2,000 pounds}} = \text{0.84 ton}$$

Therefore, the amount of PM_{10} emitted would be 14.54 pounds per site preparation day (0.84 ton per year) for 1994-1999. Similarly, 12.24 pounds per site preparation day (0.70 ton per year) would be emitted in 1999-2004. These emissions would produce elevated short-term PM_{10} concentrations, would be temporary, and would fall off rapidly with distance from the source. Similar calculations for fugitive dust emissions were performed for construction activities related to other alternatives. The results of these calculations are summarized in Table J-1.

Construction combustive emissions were estimated using the following pound per acre emission factors (U.S. Air Force, 1993):

Pollutant		**Pounds Per Acre**
Carbon monoxide	(CO)	3,820
Nitrogen oxide	(NO_x)	1,095
	PM_{10}	85
Sulfur oxide	(SO_x)	100
Volatile organic compound	(VOC)	290

Combustive emissions associated with each reuse alternative are summarized by time period in Table J-1.

Aircraft Operations. Emissions for the following aircraft activities were calculated from fleet mix and operational information inherent to each project scenario: touch-and-go, airplane queuing, takeoffs and landings, and engine run-ups. All aircraft emissions were calculated with the Emissions and Dispersion Modeling System (EDMS) model (Segal, 1991), which contains a built-in database of U.S. EPA AP-42 emission factors for various types of aircraft. EDMS was also used to calculate downwind pollutant concentrations that would occur from aircraft operations associated with each alternative. Aircraft operation emissions are summarized in Table J-2.

Other Base and/or Reuse Operations Emission Calculations. Preclosure emissions inventory data for direct sources associated with Richards-Gebaur AFB are presented in Table 3.4-7 of the Environmental Impact Statement (EIS). Although these data provide an adequate estimate of on-base preclosure emissions, they are difficult to compare to emissions from future reuse scenarios that required calculation by different forecasting methods (for both direct and indirect emissions). Therefore, to more adequately compare emissions from preclosure, closure, and reuse, all emissions were calculated using the same methodology. The following is a presentation of the methods used to calculate the these emissions.

To calculate emissions from other base and/or reuse operations (i.e., all emissions with the exception of construction fugitive dust, construction combustive emissions, and aircraft emissions), a per capita approach was

Table J-1. Construction Fugitive Dust and Combustive Emissions Associated with the Proposed Action and Alternatives
Page 1 of 2

	tons/year									
	NO_x		CO		SO_x		PM_{10}		VOC	
	1999	2004	1999	2004	1999	2004	1999	2004	1999	2004
Proposed Action										
Construction Fugitive Dust Emissions	NA	NA	NA	NA	NA	NA	0.45	0.44	NA	NA
Construction Combustive Emissions	2.41	2.19	8.40	7.64	0.22	0.20	0.19	0.17	0.64	0.58
Total	2.41	2.19	8.40	7.64	0.22	0.20	0.67	0.61	0.64	0.58
Aviation Alternative										
Construction Fugitive Dust Emissions	NA	NA	NA	NA	NA	NA	0.84	0.70	NA	NA
Construction Combustive Emissions	4.16	3.50	14.52	12.22	0.38	0.32	0.32	0.27	1.10	0.93
Total	4.16	3.50	14.52	12.22	0.38	0.32	1.16	0.98	1.10	0.93
Mixed Use Alternative										
Construction Fugitive Dust Emissions	NA	NA	NA	NA	NA	NA	1.21	0.33	NA	NA
Construction Combustive Emissions	6.02	1.64	21.01	5.73	0.55	0.15	0.47	0.13	1.60	0.44
Total	6.02	1.64	21.01	5.73	0.55	0.15	1.68	0.46	1.60	0.44

CO = carbon monoxide.
NA = not applicable.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_x = sulfur oxide.
VOC = volatile organic compound.

Table J-1. Construction Fugitive Dust and Combustive Emissions Associated with the Proposed Action and Alternatives
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	tons/year									
	NO_x		CO		SO_x		PM_{10}		VOC	
	1999	2004	1999	2004	1999	2004	1999	2004	1999	2004
Industrial Alternative										
Construction Fugitive Dust Emissions	NA	NA	NA	NA	NA	NA	1.43	0.44	NA	NA
Construction Combustive Emissions	7.12	2.19	24.83	7.64	0.65	0.20	0.55	0.17	1.89	0.58
Total	7.12	2.19	24.83	7.64	0.65	0.20	1.98	0.61	1.89	0.58

CO = carbon monoxide.
NA = not applicable.
NO_x = nitrogen oxide.
SO_2 = sulfur oxide.

Table J-2. Aircraft Operation Emissions (tons/year)
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Pollutant	Source	Preclosure	Closure	Proposed Action		Aviation Alternative		Aviation with Mixed Use Alternative		Industrial Alternative	
		1992	1994	1999	2004	1999	2004	1999	2004	1999	2004
NO_x	Aircraft Flying Operations										
	Military	10.14	1.89	2.22	2.22	2.29	2.29	1.03	1.03	2.29	2.29
	Civilian	2.13	2.90	6.34	14.88	12.10	21.15	3.16	4.39	2.23	2.77
	Aircraft Ground Operations										
	Military	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Civilian	0.12	0.12	2.69	8.14	4.60	9.19	0.02	0.03	0.02	0.02
	Total Aircraft Operations	13.66	4.91	11.25	25.24	18.99	32.63	4.21	5.44	4.54	5.08
CO	Aircraft Flying Operations										
	Military	51.79	6.10	7.08	7.12	7.12	7.12	4.90	4.90	7.22	7.22
	Civilian	79.94	105.01	134.45	180.82	142.24	180.60	165.51	211.04	119.65	139.93
	Aircraft Ground Operations										
	Military	4.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Civilian	1.97	1.97	4.10	10.88	13.59	19.34	16.46	17.72	9.57	10.67
	Total Aircraft Operations	138.65	113.08	145.63	196.82	162.95	207.06	186.88	233.66	136.44	157.83
SO_2	Aircraft Flying Operations										
	Military	1.20	0.18	0.20	0.20	0.21	0.21	0.13	0.13	0.21	0.21
	Civilian	0.24	0.33	0.73	1.48	1.04	1.79	0.45	0.63	0.32	0.39
	Aircraft Ground Operations										
	Military	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Civilian	0.02	0.02	0.27	0.59	0.26	0.52	0.00	0.00	0.00	0.00
	Total Aircraft Operations	1.55	0.53	1.20	2.27	1.51	2.52	0.58	0.76	0.53	0.60

CO = carbon monoxide.
NO_x = nitrogen oxide.
SO_2 = sulfur dioxide.

Table J-2. Aircraft Operation Emissions (tons/year)
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Pollutant	Source	Preclosure	Closure	Proposed Action		Aviation Alternative		Aviation with Mixed Use Alternative		Industrial Alternative	
		1992	1994	1999	2004	1999	2004	1999	2004	1999	2004
PM_{10}	Aircraft Flying Operations										
	Military	0.71	0.17	0.12	0.12	0.17	0.17	0.14	0.14	0.17	0.17
	Civilian	0.30	0.42	0.58	0.95	0.67	0.99	0.61	0.80	0.48	0.57
	Aircraft Ground Operations										
	Military	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Civilian	0.00	0.00	0.06	0.10	0.08	0.14	0.03	0.03	0.02	0.02
	Total Aircraft Operations	1.03	0.58	0.76	1.17	0.92	1.30	0.77	0.97	0.67	0.76
VOC	Aircraft Flying Operations										
	Military	15.30	1.96	2.25	2.26	2.26	2.26	1.77	1.77	2.30	2.30
	Civilian	3.11	4.27	6.89	12.44	7.39	10.14	7.42	9.90	5.16	6.21
	Aircraft Ground Operations										
	Military	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Civilian	0.62	0.62	1.38	5.38	1.44	2.80	0.16	0.18	0.10	0.11
	Total Aircraft Operations	20.43	6.85	10.52	20.09	11.09	15.20	9.35	11.84	7.55	8.62

PM_{10} = particulate matter equal to or less than 10 microns in diameter.
VOC = volatile organic compound.

used. Other base and/or reuse operations emissions include emissions from point, area, non-road mobile, and on-road mobile sources. Data used in the calculations included population data and emissions inventory data for Cass and Jackson counties, as well as information on the population associated either directly or indirectly with the base or reuse alternative (the "site-related" population). Cass and Jackson counties were chosen since these two counties represent the primary Region of Influence (ROI) for both socioeconomic and air quality effects.

The 1990 emission inventories for Cass and Jackson counties are presented in Table J-3. These inventories include available information on point, area, and mobile source emissions in the counties. Area and mobile source information was available for NO_x and VOC in Jackson County only. It has been assumed that area and mobile emissions in Cass County are proportional to Jackson County emissions on a per capita basis. Power plant emission sources have been excluded from the point source category for both counties since the power plants provide electricity to a grid which serves a larger area than the ROI for this analysis. Per capita emission factors for heat and power are based upon emissions from the local power facility only, as further described two paragraphs below. Aircraft operation emissions were excluded from the area and mobile source categories since these emissions are calculated specific to the base by the EDMS model, as described previously.

Table J-3. 1990 Emissions Inventories for Cass and Jackson Counties

Source	tons per year				
	NO_x	CO	SO_2	PM_{10}	VOC
Cass County					
Point Sources[a]	68	13	6	310	6
Area Sources[b]	977	ND	ND	ND	1,177
Mobile Sources[b]	1,106	ND	ND	ND	928
Cass County Total	2,151	13	6	310	2,111
Jackson County					
Point Sources[a]	2,222	493	5,932	134	3,612
Area Sources[c]	9,692	ND	ND	ND	11,681
Mobile Sources[c]	10,971	ND	ND	ND	9,210
Jackson County Total	22,885	493	5,932	134	24,503

Notes: (a) Source: (Missouri Department of Natural Resources, 1993). Emissions from major power plant sources not included.
(b) Emissions for Cass County obtained by multiplying the ratio of Cass County 1990 population (63,808) to Jackson County 1990 population (633,232) times the Jackson County emissions.
(c) Source: Kansas City Ozone State Implementation Plan, 1988. Emissions from Richards-Gebaur AFB Aircraft Flying Operations and Aircraft Ground Operations not included (refer to Table 3.4-7 in Section 3.4.3).

CO = carbon monoxide
ND = no data.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

The total population of Cass and Jackson counties in the baseline inventory year (1990), the preclosure year (1992), the closure year (1994), and the reuse years (1999 and 2004) are provided in Table J-4. The site-related populations for these same years are provided in Table J-5.

Table J-4. Population Projections for Cass and Jackson Counties

	Year				
County	1990	1992	1994	1999	2004
Cass County	63,808	66,741	68,336	72,101	74,894
Jackson County	633,232	635,763	638,416	644,660	648,355

Table J-5. Site-Related Population Residing in Cass and Jackson Counties

		County		
Alternative	Year	Cass	Jackson	Total
Preclosure	1992	1,220	994	2,214
Closure	1994	14	14	28
Proposed Action	1999	1,049	1,458	2,507
	2004	1,775	2,422	4,197
Aviation Alternative	1999	1,829	2,449	4,278
	2004	2,258	2,964	5,222
Aviation with Mixed Use Alternative	1999	1,563	2,335	3,898
	2004	2,065	2,946	5,011
Industrial Alternative	1999	973	1,313	2,286
	2004	1,608	2,100	3,708

Note: Site-related population reflects all direct and secondary workers (both military and civilian) and their dependents residing in the region as a result of base operations.

Per capita emission factors representative of on-base heating and power production were calculated by dividing the total 1992 Heating and Power Production emissions for Richards-Gebaur AFB (as shown in Table 3.4-7 of the EIS) by the total number of military (19) and civilians (2,195) working on the base in that year, i.e., a total of 2,214 persons. These per capita heating and power production factors, shown in Table J-6, are assumed to be representative of the ROI for this analysis.

Preclosure year (1992) emissions inventories for Cass and Jackson counties, Table J-7, were calculated from the 1990 inventory data using the

Table J-6. Preclosure Year (1992) Per Capita Emission Factors Associated with Heating and Power Production at Richards-Gebaur AFB

Source	NO_x	CO	SO_2	PM_{10}	VOC
Heating and Power Production (tons/year)	7.25	1.80	0.71	0.18	0.14
Per capita Emission Factor (tons/year/person)	0.003275	0.000813	0.000321	0.000081	0.000063

Note: The per capita emission factor for on-base heating and power production is calculated by dividing the total Heating and Power Production emissions for Richards-Gebaur AFB (from Table 3.4-7 in Section 3.4.3) by the total number of military (19) plus direct civilians (2,195) working on base in 1992.
CO = carbon monoxide.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Table J-7. Preclosure Year (1992) Emissions Inventories for Cass and Jackson Counties

	tons/year				
Source	NO_x	CO	SO_2	PM_{10}	VOC
Cass County					
Point Sources[a]	71	14	6	324	6
Area Sources[b]	1,006	ND	ND	ND	1,224
Mobile Sources[b]	1,104	ND	ND	ND	899
Cass County Total	2,181	14	6	324	2,130
Jackson County					
Point Sources[a]	2,231	495	5,956	135	3,626
Area Sources[c]	9,582	ND	ND	ND	11,657
Mobile Sources[c]	10,521	ND	ND	ND	8,568
Jackson County Total	22,334	495	5,956	135	23,852

Notes: (a) Calculated as 1990 inventory amounts (from Table J-3) times ratio of 1992 to 1990 county population (from Table J-4). Emissions from major power plant sources not included.
(b) Emissions for Cass County obtained by multiplying the ratio of Cass County 1992 population (66,741) to Jackson County 1992 population (635,763) times the Jackson County 1992 emissions.
(c) Values interpolated from data contained in the Kansas City Ozone State Implementation Plan, 1988. Emissions from Richards-Gebaur Aircraft Flying Operations and Aircraft Ground Operations not included.
CO = carbon monoxide.
ND = no data.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

assumption that point source emissions will grow in proportion to population growth. The 1992 NO_x and VOC area and mobile source emissions for

Jackson County were obtained by the interpolation of projections contained in the Kansas City Ozone State Implementation Plan (SIP). These inventory projections for future years reflect a reduction in VOC and NO_x emissions as a result of the mandates of the federal Clean Air Act, which require the SIP to apply all feasible measures to attain the ozone standard as expeditiously as possible. As was the case for the 1990 inventories, power plant sources have been excluded from the point source category, aircraft operation emissions have been excluded from the area and mobile source categories, and area and mobile source emissions for Cass County have been based on Jackson County per capita factors. Cass and Jackson county per capita emission factors for each emission source category are summarized in Table J-8. These county factors were developed by dividing the county emissions from Table J-7 by the 1992 population for the county from Table J-4.

Table J-8. 1992 Per Capita Emission Factors for Cass and Jackson Counties

	tons/year/person				
Source	NO_x	CO	SO_2	PM_{10}	VOC
Cass County					
Point Sources	0.001066	0.000204	0.000094	0.004858	0.000094
Area Sources	0.015071	0.000000	0.000000	0.000000	0.018336
Mobile Sources	0.016549	0.000000	0.000000	0.000000	0.013477
Cass County Total	0.032686	0.000204	0.000094	0.004858	0.031907
Jackson County					
Point Sources	0.003509	0.000779	0.009368	0.000212	0.005704
Area Sources	0.015071	0.000000	0.000000	0.000000	0.018336
Mobile Sources	0.016549	0.000000	0.000000	0.000000	0.013477
Jackson County Total	0.035129	0.000779	0.009368	0.000212	0.037518

Note: Per capita emission factors were calculated by dividing the emissions from Table J-7 by the 1992 population from Table J-4. Emissions from major power plant sources, Aircraft Flying Operations, and Aircraft Ground Operations were not included in the factors.
CO = carbon monoxide.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

The preclosure year other base-related emissions from direct and indirect sources (all sources except heating and power emissions and aircraft operation emissions) were calculated as the per capita emission factors (from Table J-8) times the 1992 site-related populations from Table J-5. These other base-related emissions are shown as the first two lines of Table J-9 for Cass and Jackson counties, respectively. Aircraft operation emissions and heating and power emissions were added to the other base-

Table J-9. Total Preclosure Year (1992) Base-Related Emissions from Direct and Indirect Sources

	tons/year				
	NO_x	CO	SO_2	PM_{10}	VOC
Cass County[a]	39.88	0.25	0.11	5.93	38.93
Jackson County[b]	34.92	0.77	9.31	0.21	37.29
Richards-Gebaur AFB Area and Mobile Source Emissions[c]	NA	12.83	0.02	0.14	NA
Aircraft Operation Emissions[d]	13.66	138.65	1.55	1.02	20.43
Heating and Power Emissions[e]	7.25	1.80	0.71	0.18	0.14
Total	95.71	154.30	11.70	7.48	96.79

Notes: (a) Calculated as 1992 Cass County per capita emission factors (from Table J-8) times the 1992 site-related Cass County population of 1,220 (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations not included.

(b) Calculated as 1992 Jackson County per capita emission factors (from Table J-8) times the 1992 site-related Jackson County population of 994 (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations not included.

(c) Includes all Richards-Gebaur AFB preclosure inventory sources except Heating and Power Production, Aircraft Flying Operations, and Aircraft Ground Operations (refer to Table 3.4-7 in Section 3.4.3). Other area and mobile source emissions of NO_x and VOCs for the base are included in the county totals.

(d) Includes emissions from Aircraft Flying Operations and Aircraft Ground Operations (refer to Table 3.4-7 in Section 3.4.3).

(e) Calculated as 1992 per capita heating and power emission factors (from Table J-6) times the 1992 site-related populations of Cass and Jackson counties.

CO = carbon monoxide.
NA = not applicable.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

related emissions to determine the total site-related emissions of NO_x and VOC. In addition, it was necessary to add the Richards-Gebaur AFB area and mobile source emissions to the CO, SO_2, and PM_{10} amounts since area and mobile source emissions data were missing from the available county information.

The same procedures described above for preclosure emissions were used to determine the other base-related emissions and total site-related emissions for the closure year (1994). The same procedure was also used to determine the other reuse-related emissions and total site-related emissions of each reuse alternative for each reuse year of concern, i.e., 1999 and 2004. The closure year emissions inventories for Cass and Jackson counties are presented in Table J-10, per capita emission factors for the counties in 1994 are contained in Table J-11, and the base-related closure emissions are summarized in Table J-12.

Table J-10. Closure Year (1994) Emissions Inventories for Cass and Jackson Counties

Source	NO_x (tons/year)	CO (tons/year)	SO_2 (tons/year)	PM_{10} (tons/year)	VOC (tons/year)
Cass County					
Point Sources[a]	73	14	6	332	6
Area Sources[b]	1,014	ND	ND	ND	1,245
Mobile Sources[b]	1,078	ND	ND	ND	849
Cass County Total	2,165	14	6	332	2,100
Jackson County					
Point Sources[a]	2,240	497	5,981	135	3,642
Area Sources[c]	9,472	ND	ND	ND	11,633
Mobile Sources[c]	10,070	ND	ND	ND	7,928
Jackson County Total	21,782	497	5,981	135	23,203

Notes: (a) Calculated as 1990 inventory amounts (from Table J-3) times ratio of 1994 to 1990 county population (from Table J-4). Emissions from major power plant sources not included.
(b) Emissions for Cass County obtained by multiplying the ratio of Cass County 1994 population (68,336) to Jackson County 1994 population (638,416) times the Jackson County 1994 emissions.
(c) Values interpolated from data contained in the Kansas City Ozone State Implementation Plan, 1988. Emissions from Richards-Gebaur Aircraft Flying Operations and Aircraft Ground Operations not included.
CO = carbon monoxide.
ND = no data.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Table J-11. 1994 Per Capita Emission Factors for Cass and Jackson Counties

Source	NO_x (tons/year/person)	CO (tons/year/person)	SO_2 (tons/year/person)	PM_{10} (tons/year/person)	VOC (tons/year/person)
Cass County					
Point Sources	0.001066	0.000204	0.000094	0.004858	0.000094
Area Sources	0.014837	0.000000	0.000000	0.000000	0.018222
Mobile Sources	0.015774	0.000000	0.000000	0.000000	0.012418
Cass County Total	0.031676	0.000204	0.000094	0.004858	0.030734
Jackson County					
Point Sources	0.003509	0.000779	0.009368	0.000212	0.005704
Area Sources	0.014837	0.000000	0.000000	0.000000	0.018222
Mobile Sources	0.015774	0.000000	0.000000	0.000000	0.012418
Jackson County Total	0.034120	0.000779	0.009368	0.000212	0.036344

Note: Per capita emission factors calculated by dividing the emissions from Table J-10 by the 1994 population from Table J-4. Emissions from major power plant sources, Aircraft Flying Operations, and Aircraft Ground Operations not included in the factors.
CO = carbon monoxide.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Table J-12. Total Closure Year (1994) Base-Related Emissions from Direct and Indirect Sources

	tons/year				
	NO_x	CO	SO_2	PM_{10}	VOC
Cass County[(a)]	0.44	0.00	0.00	0.07	0.43
Jackson County[(b)]	0.48	0.01	0.13	0.00	0.51
Aircraft Operation Emissions[(c)]	4.91	113.08	0.53	0.58	6.85
Heating and Power Emissions[(d)]	0.09	0.02	0.01	0.00	0.00
Total	5.92	113.11	0.67	0.65	7.79

Notes: (a) Calculated as 1994 Cass County per capita emission factors (from Table J-11) times the 1994 site-related Cass County population of 14 (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations not included.

(b) Calculated as 1994 Jackson County per capita emission factors (from Table J-11) times the 1994 site-related Jackson County population of 14 (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations not included.

(c) Includes emissions from Aircraft Flying Operations and Aircraft Ground Operations.

(d) Calculated as 1992 per capita heating and power emission factors (from Table J-6) times the 1994 site-related populations of Cass and Jackson counties, i.e., 28 persons (from Table J-5).

CO = carbon monoxide.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

The 1999 emission inventories for Cass and Jackson counties and the 1999 per capita emission factors for Cass and Jackson counties are shown in Tables J-13 and J-14, respectively. Similar information is provided in Tables J-15 and J-16 for 2004. The total emissions associated with reuse are summarized in Table J-17 for the Proposed Action, Table J-18 for the Aviation Alternative, Table J-19 for the Aviation with Mixed Use Alternative, and Table J-20 for the Industrial Alternative. Since Air Force operations will be eliminated by base closure, it was necessary to deduct from Tables J-17 through J-20 the Air Force emissions from Aerospace Ground Equipment, Motor Vehicles, Surface Coating, Fuel Evaporation Losses, and Solvent Degreasing which were already accounted for in the county inventories for NO_x and VOC (refer to Table 3.4-7 in the EIS).

Table J-13. 1999 Emissions Inventories for Cass and Jackson Counties

	tons/year				
Source	NO_x	CO	SO_2	PM_{10}	VOC
Cass County					
Point Sources[a]	77	15	7	350	7
Area Sources[b]	1,029	ND	ND	ND	1,294
Mobile Sources[b]	1,000	ND	ND	ND	707
Cass County Total	2,106	15	7	350	2,009
Jackson County					
Point Sources[a]	2,262	502	6,039	136	3,677
Area Sources[c]	9,197	ND	ND	ND	11,573
Mobile Sources[c]	8,944	ND	ND	ND	6,326
Jackson County Total	20,403	502	6,039	136	21,576

Notes: (a) Calculated as 1990 inventory amounts (from Table J-3) times ratio of 1999 to 1990 county population (from Table J-4). Emissions from major power plant sources not included.

(b) Emissions for Cass County obtained by multiplying the ratio of Cass County 1999 population (72,101) to Jackson County 1999 population (644,660) times the Jackson County 1999 emissions.

(c) Values interpolated from data contained in the Kansas City Ozone State Implementation Plan, 1988. Emissions from Richards-Gebaur Aircraft Flying Operations and Aircraft Ground Operations not included.

CO = carbon monoxide.
ND = no data.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Table J-14. 1999 Per Capita Emission Factors for Cass and Jackson Counties

	tons/year/person				
Source	NO_x	CO	SO_2	PM_{10}	VOC
Cass County					
Point Sources	0.001066	0.000204	0.000094	0.004858	0.000094
Area Sources	0.014266	0.000000	0.000000	0.000000	0.017952
Mobile Sources	0.013873	0.000000	0.000000	0.000000	0.009813
Cass County Total	0.029205	0.000204	0.000094	0.004858	0.027859
Jackson County					
Point Sources	0.003509	0.000779	0.009368	0.000212	0.005704
Area Sources	0.014266	0.000000	0.000000	0.000000	0.017952
Mobile Sources	0.013873	0.000000	0.000000	0.000000	0.009813
Jackson County Total	0.031649	0.000779	0.009368	0.000212	0.033469

Note: Per capita emission factors calculated by dividing the emissions from Table J-13 by the 1999 population from Table J-4. Emissions from major power plant sources, Aircraft Flying Operations, and Aircraft Ground Operations not included in the factors.

CO = carbon monoxide.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Table J-15. 2004 Emissions Inventories for Cass and Jackson Counties

	tons/year				
Source	NO_x	CO	SO_2	PM_{10}	VOC
Cass County					
Point Sources[a]	80	15	7	364	7
Area Sources[b]	1,031	ND	ND	ND	1,330
Mobile Sources[b]	903	ND	ND	ND	546
Cass County Total	2,013	15	7	364	1,883
Jackson County					
Point Sources[a]	2,275	505	6,074	137	3,698
Area Sources[c]	8,922	ND	ND	ND	11,513
Mobile Sources[c]	7,817	ND	ND	ND	4,724
Jackson County Total	19,014	505	6,074	137	19,935

Notes: (a) Calculated as 1990 inventory amounts (from Table J-3) times ratio of 2004 to 1990 county population (from Table J-4). Emissions from major power plant sources not included.

(b) Emissions for Cass County obtained by multiplying the ratio of Cass County 2004 population (74,894) to Jackson County 2004 population (648,355) times the Jackson County 2004 emissions.

(c) Values extrapolated from data contained in the Kansas City Ozone State Implementation Plan, 1988. Emissions from Richards-Gebaur Aircraft Flying Operations and Aircraft Ground Operations not included.

CO = carbon monoxide.
ND = no data.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Table J-16. 2004 Per Capita Emission Factors for Cass and Jackson Counties

	tons/year/person				
Source	NO_x	CO	SO_2	PM_{10}	VOC
Cass County					
Point Sources	0.001066	0.000204	0.000094	0.004858	0.000094
Area Sources	0.013761	0.000000	0.000000	0.000000	0.017757
Mobile Sources	0.012056	0.000000	0.000000	0.000000	0.007286
Cass County Total	0.026883	0.000204	0.000094	0.004858	0.025137
Jackson County					
Point Sources	0.003509	0.000779	0.009368	0.000212	0.005704
Area Sources	0.013761	0.000000	0.000000	0.000000	0.017757
Mobile Sources	0.012056	0.000000	0.000000	0.000000	0.007286
Jackson County Total	0.029326	0.000779	0.009368	0.000212	0.030747

Note: Per capita emission factors calculated by dividing the emissions from Table J-15 by the 2004 population from Table J-4. Emissions from major power plant sources, Aircraft Flying Operations, and Aircraft Ground Operations not included in the factors.

CO = carbon monoxide.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Table J-17. Total Reuse Emissions from Direct and Indirect Sources - Proposed Action

	tons/year									
	NO_x		CO		SO_2		PM_{10}		VOC	
	1999	2004	1999	2004	1999	2004	1999	2004	1999	2004
Cass County[a]	30.64	47.72	0.21	0.36	0.10	0.17	5.10	8.62	29.22	44.62
Jackson County[b]	46.14	71.03	1.14	1.89	13.66	22.69	0.31	0.51	48.80	74.47
Air Force Area and Mobile Source Emissions[c]	-2.96	-2.98	NA	NA	NA	NA	NA	NA	-32.31	-32.31
Aircraft Operations Emissions[d]	11.25	25.24	145.63	198.82	1.20	2.27	0.76	1.17	10.52	20.09
Heating and Power Emissions[e]	8.21	13.74	2.04	3.41	0.80	1.35	0.20	0.34	0.16	0.27
Construction Emissions[f]	2.41	2.19	8.40	7.64	0.22	0.20	0.67	0.61	0.64	0.58
Total	95.67	156.94	157.42	212.12	15.98	26.67	7.04	11.26	57.03	107.71

Notes: (a) Calculated as Cass County per capita emission factors (from Tables J-14 and J-16) times the site-related Cass County population for the year and alternative of concern (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations included.

(b) Calculated as Jackson County per capita emission factors (from Tables J-14 and J-16) times the site-related Jackson County population for the year and alternative of concern (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations not included.

(c) Since all area and mobile source Richards-Gebaur AFB NO_x and VOC emissions are included in the County totals (except as noted in footnotes a and b above), and since the base emissions related to Air Force operations will be eliminated by base closure, the NO_x and VOC Air Force emissions from Aerospace Ground Equipment, Motor Vehicles, Surface Coating, Fuel Evaporation Losses, and Solvent Degreasing must be deducted from the total.

(d) Includes emissions from Aircraft Flying Operations and Aircraft Ground Operations.

(e) Calculated as 1992 per capita heating and power emission factors (from Table J-6) times the total site-related population of Cass and Jackson counties for the year of concern (from Table J-5).

(f) Includes both fugitive dust and combustive emissions.

CO = carbon monoxide.
NA = not applicable.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Table J-18. Total Reuse Emissions from Direct and Indirect Sources - Aviation Alternative

	tons/year									
	NO_x		CO		SO_2		PM_{10}		VOC	
	1999	2004	1999	2004	1999	2004	1999	2004	1999	2004
Cass County[a]	53.42	60.70	0.37	0.46	0.17	0.21	8.89	10.97	50.95	56.76
Jackson County[b]	77.51	86.92	1.91	2.31	22.94	27.77	0.52	0.63	81.97	91.13
Air Force Area and Mobile Source Emissions[c]	-2.98	-2.98	NA	NA	NA	NA	NA	NA	-32.31	-32.31
Aircraft Operation Emissions[d]	18.99	32.63	162.95	207.06	1.51	2.52	0.92	1.30	11.09	15.20
Heating and Power Emissions[e]	14.01	17.10	3.48	4.25	1.37	1.67	0.35	0.42	0.27	0.33
Construction Emissions[f]	4.16	3.50	14.52	12.22	0.38	0.32	1.16	0.98	1.10	0.93
Total	165.10	197.87	183.22	226.30	26.37	32.49	11.83	14.29	113.07	132.04

Notes: (a) Calculated as Cass County per capita emission factors (from Tables J-14 and J-16) times the site-related Cass County population for the year and alternative of concern (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations not included.

(b) Calculated as Jackson County per capita emission factors (from Tables J-14 and J-16) times the site-related Jackson County population for the year and alternative of concern (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations not included.

(c) Since all area and mobile source Richards-Gebaur AFB NO_x and VOC emissions are included in the county totals (except as noted in footnotes a and b above), and since the base emissions related to Air Force operations will be eliminated by base closure, the NO_x and VOC Air Force emissions from Aerospace Ground Equipment, Motor Vehicles, Surface Coating, Fuel Evaporation Losses, and Solvent Degreasing must be deducted from the total.

(d) Includes emissions from Aircraft Flying Operations and Aircraft Ground Operations.

(e) Calculated as 1992 per capita heating and power emission factors (from Table J-6) times the total site-related population of Cass and Jackson counties for the year of concern (from Table J-5).

(f) Includes both fugitive dust and combustive emissions.

CO = carbon monoxide.
NA = not applicable.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Table J-19. Total Reuse Emissions from Direct and Indirect Sources - Aviation with Mixed Use Alternative

	tons/year									
	NO_x		CO		SO_2		PM_{10}		VOC	
	1999	2004	1999	2004	1999	2004	1999	2004	1999	2004
Cass County[a]	45.65	55.51	0.32	0.42	0.15	0.19	7.59	10.03	43.54	51.91
Jackson County[b]	73.90	86.40	1.82	2.29	21.87	27.60	0.49	0.62	78.15	90.58
Air Force Area and Mobile Source Emissions[c]	-2.98	-2.98	NA	NA	NA	NA	NA	NA	-32.31	-32.31
Aircraft Operation Emissions[d]	4.21	5.44	186.88	233.66	0.58	0.76	0.77	0.97	9.35	11.84
Heating and Power Emissions[e]	12.76	16.41	3.17	4.07	1.25	1.61	0.32	0.41	0.25	0.32
Construction Emissions[f]	6.02	1.64	21.01	5.73	0.55	0.15	1.68	0.46	1.60	0.44
Total	139.56	162.42	213.19	246.18	24.40	30.31	10.86	12.49	100.57	122.77

Notes: (a) Calculated as Cass County per capita emission factors (from Tables J-14 and J-16) times the site-related Cass County population for the year and alternative of concern (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations not included.

(b) Calculated as Jackson County per capita emission factors (from Tables J-14 and J-16) times the site-related Jackson County population for the year and alternative of concern (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations not included.

(c) Since all area and mobile source Richards-Gebaur AFB NO_x and VOC emissions are included in the County totals (except as noted in footnotes a and b above), and since the base emissions related to Air Force operations will be eliminated by base closure, the NO_x and VOC Air Force emissions from Aerospace Ground Equipment, Motor Vehicles, Surface Coating, Fuel Evaporation Losses, and Solvent Degreasing must be deducted from the total.

(d) Includes emissions from Aircraft Flying Operations and Aircraft Ground Operations.

(e) Calculated as 1992 per capita heating and power emission factors (from Table J-6) times the total site-related population of Cass and Jackson counties for the year of concern (from Table J-5).

(f) Includes both fugitive dust and combustive emissions.

CO = carbon monoxide.
NA = not applicable.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

Table J-20. Total Reuse Emissions from Direct and Indirect Sources - Industrial Alternative

	tons/year									
	NO_x		CO		SO_2		PM_{10}		VOC	
	1999	2004	1999	2004	1999	2004	1999	2004	1999	2004
Cass County[a]	28.42	43.23	0.20	0.33	0.09	0.15	4.73	7.81	27.11	40.42
Jackson County[b]	73.90	86.40	1.82	2.29	21.87	27.60	0.49	0.62	78.15	90.58
Air Force Area and Mobile Source Emissions[c]	-2.98	-2.98	NA	NA	NA	NA	NA	NA	-32.31	-32.31
Aircraft Operation Emissions[d]	4.54	5.08	136.44	157.83	0.53	0.60	0.67	0.76	7.55	8.62
Heating and Power Emissions[e]	7.49	12.14	1.86	3.01	0.73	1.19	0.19	0.30	0.14	0.23
Construction Emissions[f]	7.12	2.19	24.83	7.64	0.65	0.20	1.98	0.61	1.89	0.58
Total	118.48	146.06	165.15	171.10	23.88	29.74	8.06	10.11	82.53	108.12

Notes: (a) Calculated as Cass County per capita emission factors (from Tables J-14 and J-16) times the site-related Cass County population for the year and alternative of concern (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations not included.

(b) Calculated as Jackson County per capita emission factors (from Tables J-14 and J-16) times the site-related Jackson County population for the year and alternative of concern (from Table J-5). Emissions from power plants, Aircraft Flying Operations, and Aircraft Ground Operations not included.

(c) Since all area and mobile source Richards-Gebaur AFB NO_x and VOC emissions are included in the County totals (except as noted in footnotes a and b above), and since the base emissions related to Air Force operations will be eliminated by base closure, the NO_x and VOC Air Force emissions from Aerospace Ground Equipment, Motor Vehicles, Surface Coating, Fuel Evaporation Losses, and Solvent Degreasing must be deducted from the total.

(d) Includes emissions from Aircraft Flying Operations and Aircraft Ground Operations.

(e) Calculated as 1992 per capita heating and power emission factors (from Table J-6) times the total site-related population of Cass and Jackson counties for the year of concern (from Table J-5).

(f) Includes both fugitive dust and combustive emissions.

CO = carbon monoxide.
NA = not applicable.
NO_x = nitrogen oxide.
PM_{10} = particulate matter equal to or less than 10 microns in diameter.
SO_2 = sulfur dioxide.
VOC = volatile organic compound.

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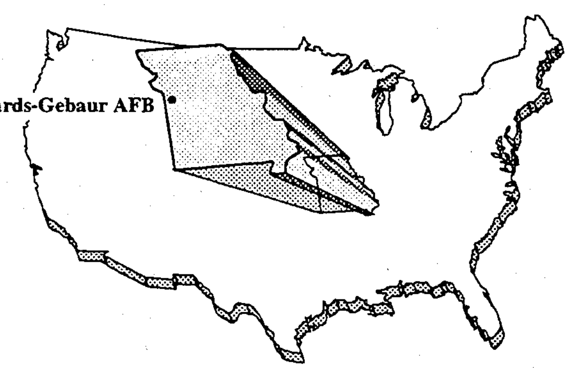


APPENDIX K

APPENDIX K

AGENCY LETTERS AND CERTIFICATIONS

STATE OF MISSOURI
Mel Carnahan, Governor • David A. Shorr, Director
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF STATE PARKS
P.O. Box 176 Jefferson City, MO 65102-0176 (314)751-2479
FAX (314)751-8656

August 17, 1993

Mr. Bruce R. Leighton, Technical Assistant
Environmental Planning Division
Department of the Air Force AFCEE
8106 Chennault Road
Brooks AFB, Texas 78235-5318

Re: Archaeological Resources, Proposed Disposal of Excess Property, Richards-Gebaur Air Force Base, Missouri

Dear Mr. Leighton:

In response to your letter dated 10 August 1993 concerning the above referenced undertaking, the Missouri Historic Preservation Program has reviewed our records. We have determined that the proposed disposal of excess properties at Richards-Gebaur Air Force Base should have no effect on any archaeological resources as none are recorded in the area. Therefore, we have no objection to the initiation of project activities relative to archaeological resources. However, as we have determined Building 602 potentially eligible for the National Register of Historic Places, compliance with Sections 106 and 110 of the National Historic Preservation Act (P.L. 89-665, as amended) and the Advisory Council on Historic Preservation's regulation Protection of Historic Properties (36 CFR Part 800) must be met.

If I can be of further assistance, please write; or call 314/751-7958.

Sincerely,

HISTORIC PRESERVATION PROGRAM

Michael S. Weichman
Senior Archaeologist

mc

23 JUN 1993

Mr Chet Ellis
Heart of America Indian Center
1340 East Admiral
Kansas City, MO 64106

Dear Mr Ellis

The Department of the Air Force is in the process of preparing an Environmental Impact Statement for the disposal and reuse of Richards-Gebaur Air Force Base, MO, which is scheduled to close in Sep 94. As a part of this effort, and in compliance with the American Indian Religious Freedom Act and the Native American Graves Protection and Repatriation Act, the Air Force is initiating activities to identify any significant cultural resources that may exist within the area of potential effect (APE).

To ensure that any areas of sacred or heritage concern to local Native American groups are considered during project planning, the Air Force would appreciate your help in identifying any groups or individuals who might have interest in project activities, or any traditional resources that may exist within the APE. In seeking this information, it is the Air Force's goal to protect areas important to Native Americans who now live, or have lived in the past, within the project area.

Thank you for your cooperation and assistance with Air Force efforts to address any possible Native American concerns related to this disposal action. If you have any questions, please do not hesitate to contact our Program Manager, Ms Marion Erwin, at (210) 536-3690. Her address is AFCEE/ESER, 8106 Chennault Road, Brooks AFB, TX 78235-5318.

Sincerely

SIGNED

GARY P. BAUMGARTEL, Lt Col, USAF
Chief, Environmental Planning Division
Environmental Services

ESER (COORD) MSE 23JUN93 ESER (READ FILE) ESE (READ FILE)

United States Department of the Interior

TAKE PRIDE IN AMERICA

FISH AND WILDLIFE SERVICE
Fish and Wildlife Enhancement
Columbia Field Office
608 East Cherry Street
Columbia, Missouri 65201

IN REPLY REFER TO:

FWS/AFWE-CMFO

APR 0 1 1993

Gary P. Baumgartel, Lt. Col.
AFCEE/ESER
8106 Chennault Road
Brooks AFB, Texas 78235-5318

Dear Lt. Colonel Baumgartel:

This responds to your March 3, 1993, letter requesting comments from the U.S. Fish and Wildlife Service (Service) on federally-listed or proposed threatened and endangered species that may be affected by the proposed reuse actions and alternatives for the disposal of Richards-Gebaur Air Force Base located in Cass and Jackson Counties, Missouri.

These comments are provided as technical assistance and predevelopment consultation and do not constitute a Service report under authority of the Fish and Wildlife Coordination Act (Coordination Act) (16 U.S.C. 661 et seq.) on any required Federal environmental review or permit or license application:

1. The proposed activity does not appear to impact Federal fish and wildlife management facilities. We suggest you contact either the Missouri Department of Conservation (P.O. Box 180, Jefferson City, Missouri 65102) or the Missouri Department of Natural Resources (P.O. Box 176, Jefferson City, Missouri 65102) for information on State-managed areas.

2. From our review of available information, no federally-listed endangered or threatened species occur in the proposed project area. However, please contact the Missouri Department of Conservation concerning state-listed rare and endangered species.

We appreciate the opportunity to review this project. Should you have questions concerning these comments, or if we can be of further assistance, please contact Ms. Janet Haslerig at the above address, or by telephone at (314) 876-1911.

Sincerely,

Rik L. Hansen

for Jerry J. Brabander
Field Supervisor

cc: MDC; Jefferson City, MO (Attn: Dan Dickneite)
MDC; Jefferson City, MO (Attn: Dennis Figg)

JMH:jh:1210/XCRGAFXA

MISSOURI DEPARTMENT OF CONSERVATION

MAILING ADDRESS
P.O. Box 180
Jefferson City, Missouri 65102-0180

STREET LOCATION
2901 West Truman Boulevard
Jefferson City, Missouri

Telephone: 314/751-4115
Missouri Relay Center 1-800-735-2966 (TDD)
JERRY J. PRESLEY, Director

March 11, 1993

The Earth Technology Corporation
Attn: Barbara Zeman
1461 E. Cooley Drive
Suite 100
Colton, CA 92324

Dear Ms. Zeman:

I am responding to your letter of March 3, 1993 regarding disposal and reuse of Richards-Gebaur ARS south of Kansas City. The likelihood of endangered species at this location seems small. The Department has conducted natural features inventory in Jackson and Cass counties. This part of the state has been included in several additional surveys directed at listed plants and animals. While much of the area was formerly tallgrass prairie, it has been entirely converted to fescue and other nonnative species and generally lacks habitat for endangered species.

About 5 years ago the Department obtained information that "fragrant milkweed" was once known from the area. Since this is one common name for Mead's milkweed (Asclepias meadii), a federally threatened species, we conducted limited surveys on and around the ARS. We found nothing to indicate this species persists today.

I can think of two species that may deserve additional survey work. The first is the greater prairie chicken, a state Rare species. Remnant prairie chicken populations do persist on grasslands south and west of Richards-Gebaur. April would be a good time to listen for courtship males in the early morning. The second species is auriculate false foxglove (Agalinis auriculata), a federal candidate for listing as threatened or endangered and listed Rare in Missouri. This species occurs on private land west of Richards-Gebaur. It can persist is areas with a great deal of soil disturbance. Surveys for this species must be conducted in late summer when the species flowers. Additional information on the species is available by contacting our botanist, Tim Smith, at the address on this letterhead.

Sincerely,

Dennis E. Figg
Endangered Species Coordinator

DEF/fef

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 15 July 1993
Name Of Project Richards-Gebaur AFB - Disposal and Reuse	Federal Agency Involved USAF, FAA
Proposed Land Use Aviation Support - Industrial/Mixed Use	County And State Jackson and Cass Counties, MO
PART II *(To be completed by SCS)*	Date Request Received By SCS 7-21-93

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply — do not complete additional parts of this form).* Yes ☒ No ☐	Acres Irrigated 0	Average Farm Size 189
Major Crop(s) Corn, Soybeans, wheat	Farmable Land In Govt. Jurisdiction Acres: 395616 % 92	Amount Of Farmland As Defined in FPPA Acres: 395616 % 92
Name Of Land Evaluation System Used Cass Co. LESA	Name Of Local Site Assessment System	Date Land Evaluation Returned By SCS 8-11-93

	Maximum Points	Site A/1	Site B/2	Site C	Site D
PART III *(To be completed by Federal Agency)*		Alternative Site Rating			
A. Total Acres To Be Converted Directly		242	184		
B. Total Acres To Be Converted Indirectly		0	0		
C. Total Acres In Site		242	184		
PART IV *(To be completed by SCS)* Land Evaluation Information		NO			
A. Total Acres Prime And Unique Farmland			70		
B. Total Acres Statewide And Local Important Farmland		Rating	114		
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted			.005		
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value			48.5		
PART V *(To be completed by SCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*			71.4		
PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b))*	Maximum Points				
1. Area In Nonurban Use			13		
2. Perimeter In Nonurban Use			8		
3. Percent Of Site Being Farmed			7		
4. Protection Provided By State And Local Government			20		
5. Distance From Urban Builtup Area			15		
6. Distance To Urban Support Services			2		
7. Size Of Present Farm Unit Compared To Average			9.5		
8. Creation Of Nonfarmable Farmland			0		
9. Availability Of Farm Support Services			5		
10. On-Farm Investments			4		
11. Effects Of Conversion On Farm Support Services			0		
12. Compatibility With Existing Agricultural Use			0-5*		
TOTAL SITE ASSESSMENT POINTS	160		83.5-88.5*		
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100		71.4		
Total Site Assessment *(From Part VI above or a local site assessment)*	160		83.5-88.5*		
TOTAL POINTS *(Total of above 2 lines)*	260		154.9-159.9*		

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

Site 1 is considered urban (building on sites etc); therefore there is no rating.

*Refer to attached detailed explanation for scores by reuse alternative for Site 2 (Training Annex)

K-5

(See Instructions on reverse side) Form AD-1006 (10-83)

FARMLAND CONVERSION RATING FORM AD-1006
SECTION VI SCORING
RICHARDS-GEBAUR AFB DISPOSAL AND REUSE EIS
BELTON TRAINING COMPLEX (SITE 2 ON FORM)

1. **How much land is in nonurban use within a radius of 1.0 miles from where the project is intended?**

   - **More than 90 percent- 15 points**
   - **90 to 20 percent- 14 to 1 point**
   - **less than 20 percent- 0 points**

All alternatives:
15 percent low density (suburban) residential
85 percent non-urban — 13 points

2. **How much of the perimeter of the site borders on land in nonurban use?**

   - **More than 90 percent- 10 points**
   - **90 to 20 percent- 9 to 1 points**
   - **Less than 20 percent- 0 points**

All alternatives:
25 percent urban (low density suburban residential)
75 percent nonurban — 8 points

3. **How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?**

   - **More than 90 percent- 20 points**
   - **90 to 20 percent- 19 to 1 points**
   - **Less than 20 percent- 0 points**

All alternatives:
A maximum of 80 acres of hay production on the Belton Training Complex (80/184 acres = 43 percent) — 7 points

4. **Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?**

- **Site is protected- 20 points**
- **Site is not protected- 0 points**

All alternatives:

Belton Training Complex is zoned for agricultural use by Cass County; would require legal action to change to other land use

20 points

5. How close is the site to an urban built-up area?

- **2 miles or more- 15 points**
- **More than 1 but less than 2 miles- 10 points**
- **Less than 1 mile, but not adjacent- 5 points**
- **Adjacent to an urban built-up area- 0 points**

All alternatives:

Nearest built up area is Belton, greater than 2 miles to the north of the site 15 points

6. How close is the site to water lines, sewer lines, and/or other local facilities and services whose capacities and design would promote nonagricultural use?

- **No services closer than 3 miles- 15 points**
- **Some services exist greater than 1 but less than 3 miles- 10 points**
- **All services within 1/2 mile of the site- 0 points**

All alternatives:

All services except sanitary sewer are located within 1/2 mile of the Belton Training Complex 2 points

7. Is the farm unit(s) containing the site(s) (before the project) as large as the average size farming unit in the county? (See Form AD 1006)

- **As large or larger- 10 points**
- **Below average- deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average- 9 to 0 points**

All alternatives:

Size of site- 184 acres
Average size of farm- 189 acres
Site is 2.6 percent smaller than average 9.5 points

8. If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?

- **Acreage equal to more than 25 percent of acres being directly converted by the project- 10 points**
- **Acreage equal to between 25 and 5 percent of the acres directly converted by the project- 9 to 1 point**
- **Acreage equal to less than 5 percent of the acres directly converted by the project- 0 points**

Proposed Action	n/a
Aviation Alternative (Residential land use)	0 points
Aviation/Mixed Use Alternative (Public facilities/recreation)	0 point
Industrial Alternative (Agricultural)	n/a
No-Action Alternative (Military-caretaker)	0 points

9. Does the site have available adequate supply of farm support services and markets (i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets)?

- **All required services are available- 5 points**
- **Some required services are available- 4 to 1 points**
- **No required services are available- 0 points**

All alternatives:

Region has all necessary support services 5 points

10. Does the site have substantial and well-maintained on-farm investments such as barns, other storage buildings, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?

- **High amount of on-farm investment- 20 points**
- **Moderate amount of on-farm investments-19 to 1 points**
- **No on-farm investments- 0 points**

All Alternatives:

On-site igloos could be used for storage; natural drainage and soil. No other investments 4 points

11. Would the project at this site, by converting farmland to non-agricultural use, reduce the demand for farm support services so as to jeopardize the continued

existence of these support services, and thus, the viability of the farms in the area?

- **Substantial reduction in demand for support services if the site is converted- 10 points**
- **Some reduction in demand in support services if the site is converted- 9 to 1 points**
- **No significant reduction in demand for support services if the site is converted- 0 points**

No reduction in demand if the site is converted	0 points

12. Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to non-agricultural use?

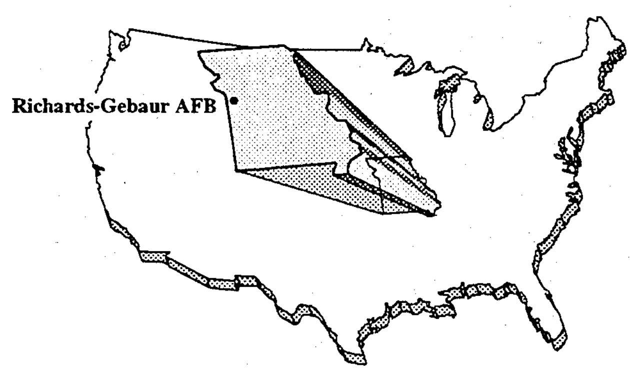
- **Proposed project is incompatible with existing agricultural use of surrounding farmland- 10 points**
- **Proposed project is tolerable to existing agricultural use of surrounding farmland- 9 to 1 points**
- **Proposed project is fully compatible with existing agricultural use of surrounding farmland- 0 points**

Proposed Action	n/a
Aviation Alternative (Residential land use)	5 points
Aviation/Mixed Use Alternative (Public facilities/recreation)	1 point
Industrial Alternative (Agricultural)	n/a
No-Action Alternative (Military-caretaker)	0 points

Table K-1. Scoring Summary: Section VI of Form AD-1006 by Alternative Reuse of Belton Training Complex.

Criteria	Proposed Action	Aviation Alternative	Aviation/ Mixed Alternative	Industrial Alternative	No-Action Alternative
1	n/a (1)	13	13	n/a (1)	13
2	n/a	8	8	n/a	8
3	n/a	7	7	n/a	7
4	n/a	20	20	n/a	20
5	n/a	15	15	n/a	15
6	n/a	2	2	n/a	2
7	n/a	9.5	9.5	n/a	9.5
8	n/a	0	0	n/a	0
9	n/a	5	5	n/a	5
10	n/a	4	4	n/a	4
11	n/a	0	0	n/a	0
12	n/a	5	1	n/a	0
Score Total (Section VI)	n/a	88.5	84.5	n/a	83.5
Score Total (Entire Form)	n/a	159.9	155.9	n/a	154.9

Note: (1) Scoring not applicable because reuse would be agricultural development of property or agricultural land is not to be converted; score is for alternatives which would convert potentially agricultural land to other uses.



APPENDIX L

APPENDIX L

ENVIRONMENTAL IMPACTS OF RICHARDS-GEBAUR AFB REUSE BY LAND USE CATEGORY

APPENDIX L

ENVIRONMENTAL IMPACTS OF RICHARDS-GEBAUR AFB REUSE BY LAND USE CATEGORY

INTRODUCTION

The purpose of this appendix is to quantify the environmental impacts of each land use category identified for the Proposed Action and three reuse alternatives evaluated in this Environmental Impact Statement (EIS). The data in Tables L-1 through L-16 present the impacts of individual land use activities, such as industrial, commercial, or institutional, on their respective Regions of Influence and allow comparison of the impacts of the alternatives for three benchmark years, 1999, 2004, and 2014, where applicable. Figures L-1 through L-4 display the parcels in the various land use categories for each alternative.

Tables L-1 through L-4 present data on the influencing factors (factors that drive environmental impacts); Tables L-5 through L-16 list the impacts on individual environmental resources evaluated in the EIS. These resources include transportation, utilities, hazardous materials and hazardous waste management, soils and geology, noise, biological resources, and cultural resources. This appendix includes at least one table for each resource area, except water resources. Data on water demand are presented as part of the utilities analysis; the effects on surface and groundwater resources in and around the base have not been quantified in the EIS and have not been disaggregated in this appendix. The air emissions associated with each alternative for each benchmark year are described in detail in Appendix J and have not been included in this Appendix.

No quantification is provided in Table L-11 because the quantities of hazardous materials used and hazardous wastes generated will depend on the type and intensity of industrial and commercial activities developed on the site. Table L-11 presents a generalized description of the hazardous materials used under individual land use categories. Table L-12 summarizes the number of Installation Restoration Program sites identified on the base as of 1993, but does not give the likely status of these sites in 1999, 2004, and 2014.

Factors and assumptions used in disaggregating the total impacts of an alternative into individual land use categories are presented as footnotes on the relevant tables.

Table L-1. Direct Employment by Land Use Category, Richards-Gebaur AFB Reuse

	1999				2004				2014			
Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	156	220	37	40	289	222	34	40	551	213	34	36
Industrial	94	244	231	252	173	423	454	517	332	425	682	768
Office/industrial park	78				145				277			
Institutional (medical/educational)	0	0	27	50	0	0	24	50	0	0	24	46
Commercial	32	0	353	71	57	0	350	71	110	0	349	67
Residential	0	24	0	0	0	20	0	0	0	10	0	0
Public facilities/recreation	0	291	20	0	0	290	18	0	0	279	20	0
Military	211				211				211			
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Total	571	779	668	416	875	955	880	678	1,481	927	1,109	917

Table L-2. Total Employment by Land Use Category, Richards-Gebaur AFB Reuse

	1999				2004				2014			
Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt.1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	327	467	84	86	578	469	75	84	1,137	449	76	76
Industrial	197	518	523	539	346	893	1,002	1,095	685	893	1,487	1,614
Office/industrial park	164				290				572			
Institutional (medical/educational)	0	0	61	107	0	0	52	105	0	0	53	97
Commercial	67	0	798	152	114	0	773	150	227	0	762	141
Residential	0	51	0	0	0	43	0	0	0	21	0	0
Public facilities/recreation	0	618	45	0	0	613	40	0	0	586	44	0
Military	442				421				435			
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,197	1,654	1,511	884	1,749	2,018	1,942	1,434	3,056	1,949	2,422	1,928

Note: Total includes direct and secondary employment.
P.A. = Proposed Action.
Alt. 1 = Aviation Alternative.
Alt. 2 = Aviation with Mixed Use Alternative.
Alt. 3 = Industrial Alternative.

Table L-3. Population In-Migration by Land Use Category, Richards-Gebaur AFB Reuse

	1999				2004				2014			
Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	16	39	7	7	38	39	6	7	84	38	6	6
Industrial	10	43	43	43	23	75	82	89	50	76	122	134
Office/industrial park	8				19				42			
Institutional (medical/educational)	0	0	5	8	0	0	4	8	0	0	4	8
Commercial	3	0	63	12	8	0	62	12	17	0	62	12
Residential	0	4	0	0	0	4	0	0	0	2	0	0
Public facilities/recreation	0	51	4	0	0	51	3	0	0	50	4	0
Military	21				28				32			
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Total	58	137	122	70	116	169	157	116	225	166	198	160

Table L-4. Land Use Impacts by Land Use Category, Richards-Gebaur AFB Reuse (acres)

	1999				2004				2014			
Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	22	60	49	25	44	72	51	25	87	85	63	25
Industrial	14	53	50	49	26	73	79	102	57	84	100	125
Office/industrial park	12				24				46			
Institutional (medical/educational)	NA	0	13	62	NA	0	13	62	NA	0	13	62
Commercial	1	0	22	6	2	0	22	6	5	0	22	6
Residential	NA	105	0	5	NA	197	0	19	NA	197	0	19
Public facilities/recreation	NA	30	212	5	NA	30	212	5	NA	30	212	5
Military	231				231				231			
Agriculture	NA	0	0	184	NA	0	0	184	NA	0	0	184
Total	280	248	347	336	327	372	377	403	426	396	410	426

Note: Population in-migration is based on projected total employment for each land use category.
P.A. = Proposed Action.
Alt. 1 = Aviation Alternative.
Alt. 2 = Aviation with Mixed Use Alternative.
Alt. 3 = Industrial Alternative.

Table L-5. Transportation Impacts by Land Use Category, Richards-Gebaur AFB Reuse (average daily vehicle trips)

	1999				2004				2014			
Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	322	772	391	362	322	939	495	461	1,289	1,064	681	583
Industrial	161	470	458	495	430	886	964	1,058	644	993	1,453	1,591
Office/industrial park	215	0	0	0	0	0	0	0	859	0	0	0
Institutional (medical/educational)	0	0	103	340	996	0	103	340	0	0	103	340
Commercial	498	0	2,581	744	0	0	2,581	744	1,991	0	2,581	744
Residential	0	686	0	109	0	978	0	676	0	978	0	676
Public facilities/recreation	0	860	467	0	505	860	467	0	0	860	467	0
Military	505	0	0	0	0	0	0	0	505	0	0	0
Agriculture	0	0	0	0	2,898	0	0	0	0	0	0	0
Total	1,701	2,788	4,000	2,050		3,663	4,610	3,279	5,288	3,835	5,285	3,934

Table L-6. Water Use by Land Use Category, Richards-Gebaur AFB Reuse (gallons per day)

	1999				2004				2014			
Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	12,044	12,200	2,335	625	24,008	13,580	2,335	625	48,175	13,630	2,335	625
Industrial	49,665	9,000	8,760	9,480	99,330	16,200	17,680	20,040	198,660	19,460	27,040	29,680
Office/industrial park	7,967	0	0	0	15,935	0	0	0	31,870	0	0	0
Institutional (medical/educational)	0	0	4,725	2,125	0	0	4,725	2,125	0	0	4,725	2,125
Commercial	3,363	0	8,940	1,840	6,725	0	8,940	1,840	13,450	0	8,940	1,840
Residential	0	16,850	200	6,550	0	28,700	200	24,300	0	28,700	200	24,300
Public facilities/recreation	0	5,440	0	0	0	5,440	0	0	0	5,440	0	0
Military	46,725	0	0	0	46,725	0	0	0	46,725	0	0	0
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Total	119,764	43,490	24,960	20,620	192,803	63,920	33,880	48,930	338,880	67,230	43,240	58,570

Note: On-site demand.
P.A. = Proposed Action.
Alt. 1 = Aviation Alternative.
Alt. 2 = Aviation with Mixed Use Alternative.
Alt. 3 = Industrial Alternative.

Table L-7. Wastewater Generation by Land Use Category, Richards-Gebaur AFB Reuse (gallons per day)

	1999				2004				2014			
Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt.1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	12,844	15,251	2,921	781	25,688	16,976	2,921	781	51,375	17,038	2,921	781
Industrial	50,050	11,250	10,950	11,850	100,100	20,250	22,100	25,050	200,200	24,325	33,800	37,100
Office/industrial park	8,289				16,578				33,155			
Institutional (medical/educational)	0	0	5,906	2,657	0	0	5,906	2,657	0	0	5,906	2,657
Commercial	3,586	0	11,175	2,300	7,172	0	11,175	2,300	14,343	0	11,175	2,300
Residential	0	21,063	250	8,188	0	35,876	250	30,376	0	35,876	250	30,376
Public facilities/recreation	0	6,800	0	0	0	6,800	0	0	0	6,800	0	0
Military	10,094				10,094				10,094			
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Total	84,863	54,363	31,202	25,776	159,632	79,902	42,352	61,164	309,167	84,039	54,052	73,214

Table L-8. Solid Waste Generation by Land Use Category, Richards-Gebaur AFB Reuse (tons per day)

		1999				2004				2014		
Land Use Category	P.A	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	0.37	0.30	0.04	0.04	0.74	0.31	0.04	0.04	1.47	0.31	0.04	0.04
Industrial	0.60	0.11	0.11	0.12	1.19	0.20	0.22	0.25	2.39	0.21	0.34	0.38
Office/industrial park	0.30				0.60				1.21			
Institutional (medical/educational)	0.00	0.00	0.13	0.07	0.00	0.00	0.13	0.07	0.00	0.00	0.13	0.07
Commercial	0.11	0.00	0.68	0.11	0.23	0.00	0.68	0.11	0.46	0.00	0.68	0.11
Residential	0.00	0.35	0.02	0.12	0.00	0.54	0.02	0.44	0.00	0.54	0.02	0.44
Public facilities/recreation	0.00	0.54	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.54	0.00	0.00
Military	0.91				0.91				0.91			
Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.29	1.30	0.98	0.46	3.67	1.59	0.09	0.91	6.44	1.60	1.21	1.04

Note: P.A. = Proposed Action.
Alt. 1 = Aviation Alternative.
Alt. 2 = Aviation with Mixed Use Alternative.
Alt. 3 = Industrial Alternative.

Table L-9. Electricity Use by Land Use Category, Richards-Gebaur AFB Reuse (megawatt hours per day)

	1999				2004				2014			
Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	3.10	5.60	4.95	2.45	6.20	6.75	5.14	2.45	12.39	8.11	6.27	2.45
Industrial	8.51	5.54	5.40	5.83	17.01	9.98	10.90	12.35	34.02	10.28	16.67	18.64
Office/industrial park	4.54				9.08				18.15			
Institutional (medical/educational)	0.00	0.00	1.27	3.68	0.00	0.00	1.27	3.68	0.00	0.00	1.27	3.68
Commercial	1.19	0.00	2.36	0.69	2.38	0.00	2.36	0.69	4.75	0.00	2.36	0.69
Residential	0.00	2.94	0.00	0.63	0.00	4.40	0.00	2.42	0.00	4.40	0.00	2.42
Public facilities/recreation	0.00	1.30	0.00	0.02	0.00	1.30	1.00	0.02	0.00	1.30	1.00	0.02
Military	4.65				4.65				4.65			
Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	21.99	15.38	14.98	13.31	39.32	22.43	20.67	21.61	73.96	24.09	27.57	27.90

Table L-10. Natural Gas Use by Land Use Category, Richards-Gebaur AFB Reuse (million cubic feet per day)

	1999				2004				2014			
Land Use Category	P.A	Alt. 1	Alt. 2	Alt. 3	P.A	Alt. 1	Alt. 2	Alt. 3	P.A	Alt. 1	Alt. 2	Alt. 3
Aviation support	0.03	0.06	0.05	0.03	0.06	0.07	0.05	0.03	0.11	0.10	0.07	0.02
Industrial	0.14	0.06	0.06	0.06	0.28	0.11	0.12	0.14	0.57	0.11	0.18	0.21
Office/industrial park	0.04				0.09				0.17			
Institutional (medical/educational)	0.00	0.00	0.02	0.06	0.00	0.00	0.02	0.06	0.00	0.00	0.02	0.05
Commercial	0.02	0.00	0.04	0.01	0.03	0.00	0.04	0.01	0.06	0.00	0.04	0.01
Residential	0.00	0.08	0.00	0.02	0.00	0.12	0.00	0.07	0.00	0.12	0.00	0.07
Public facilities/recreation	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00
Military	0.08				0.08				0.08			
Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.31	0.21	0.18	0.18	0.54	0.31	0.24	0.31	0.99	0.34	0.32	0.36

Note: On-site demand.
P.A. = Proposed Action.
Alt. 1 = Aviation Alternative.
Alt. 2 = Aviation with Mixed Use Alternative.
Alt. 3 = Industrial Alternative.

Table L-11. Hazardous Materials Usage by Land Use Category, Richards-Gebaur AFB Reuse, 1999-2014

Land Use Category	Proposed Action	Aviation Alternative	Aviation with Mixed Use Alternative	Industrial Alternative
Aviation support	Fuels, solvents, paints, POL, hydraulic fluids, degreasers, corrosives, heavy metals, reactives, thinners, glycols, ignitibles, heating oils, cyanides	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Industrial	Fuels, solvent, heavy metals, POL, corrosives, catalysts, aerosols, heating oils, ignitibles, pesticides	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Institutional (medical/educational)	NA	NA	NA	Corrosives, ignitables, solvents, heating oils, cleaners, pesticides, paints, thinners, pharmaceuticals, chemotherapy drugs, radiological sources, heavy metals
Commercial	Fuels, solvents, POL, corrosives, ignitables, heating oils, pesticides	NA	Same as Proposed Action	Same as Proposed Action
Residential	NA	Pesticides, fertilizers, fuels, oils, chlorine, household chemicals	Same as Aviation Alternative	Same as Aviation Alternative
Public facilities/ recreation	NA	Pesticides, fertilizers, chlorine, heating oils, paints, thinners, cleaners, solvents, aerosols, POL	Same as Aviation Alternative	Same as Aviation Alternative
Military	Fuels, solvents, corrosives, heavy metals, paint, thinners, pesticides, pharmaceuticals, radiological sources, chlorine, lead-acid batteries	NA	NA	NA
Agriculture	NA	NA	NA	Fuels, solvents, pesticides, fertilizers, paints, thinners

Note: Quantities of hazardous materials used will depend on the specific industrial development and are not reported here.
NA = Not applicable.
POL = petroleum, oil, and lubricants.

Table L-12. Number of Installation Restoration Program Sites by Land Use Category Richards-Gebaur AFB Reuse

	1992			
Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	3	5	2	1
Industrial	2	2	6	4
Office/industrial park	2			
Institutional (medical/educational)	NA	NA	0	2
Commercial	0	NA	0	1
Residential	NA	0	NA	0
Public facilities/recreation	NA	1	0	0
Military	1			
Agriculture	NA	NA	NA	0

Table L-13. Soils and Geology Impacts by Land Use Category, Richards-Gebaur AFB Reuse, 1999-2014 (acres of soil disturbance)

		1999				2004				2014		
Land Use Category	P.A	Alt. 1	Alt. 2	Alt. 3	P.A.	Alt. 1	Alt. 2	Alt. 3	P.A	Alt. 1	Alt. 2	Alt. 3
Aviation support	1	7	4	2	1	2	1	0	2	9	1	0
Industrial	13	10	9	10	13	12	14	12	26	1	16	18
Office/industrial park	5				5				11			
Institutional (medical/educational)	NA	NA	1	7	NA	NA	0	0	NA	NA	0	0
Commercial	1	NA	4	2	1	NA	0	0	2	NA	0	0
Residential	NA	19	NA	3	NA	18	NA	8	NA	0	NA	0
Public facilities/recreation	NA	2	37	5	NA	0	0	0	NA	0	0	0
Military	2				0				0			
Agriculture	NA	NA	NA	36	NA	NA	NA	0	NA	NA	NA	0
Total	22	38	55	65	22	32	15	20	41	10	17	18

Note: Table shows Installation Restoration Program sites as of 1992. The number of sites over the 1992 - 2014 period would change as remediation measures are implemented for individual sites.
P.A. = Proposed Action.
Alt. 1 = Aviation Alternative.
Alt. 2 = Aviation with Mixed Use Alternative.
Alt. 3 = Industrial Alternative.
NA = Standard land use designation not applicable to this alternative.

Table L-14. Expected Noise Levels by Land Use Category, Richards-Gebaur AFB Reuse, 1999-2014 (typical day-night average sound level in decibels)

Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	65-70	65-75	0	0
Industrial	65-70	65-70	0	0
Office/industrial park	0	0		
Institutional (medical/educational)	0	0	0	0
Commercial	0	0	0	0
Residential	0	0	0	0
Public facilities/recreation	0	0	0	0
Military	0	0	0	0
Agriculture	0	0	0	0

Table L-15. Biological Resource Impacts by Land Use Category, Richards-Gebaur AFB Reuse (acres of wetland habitat disturbed)

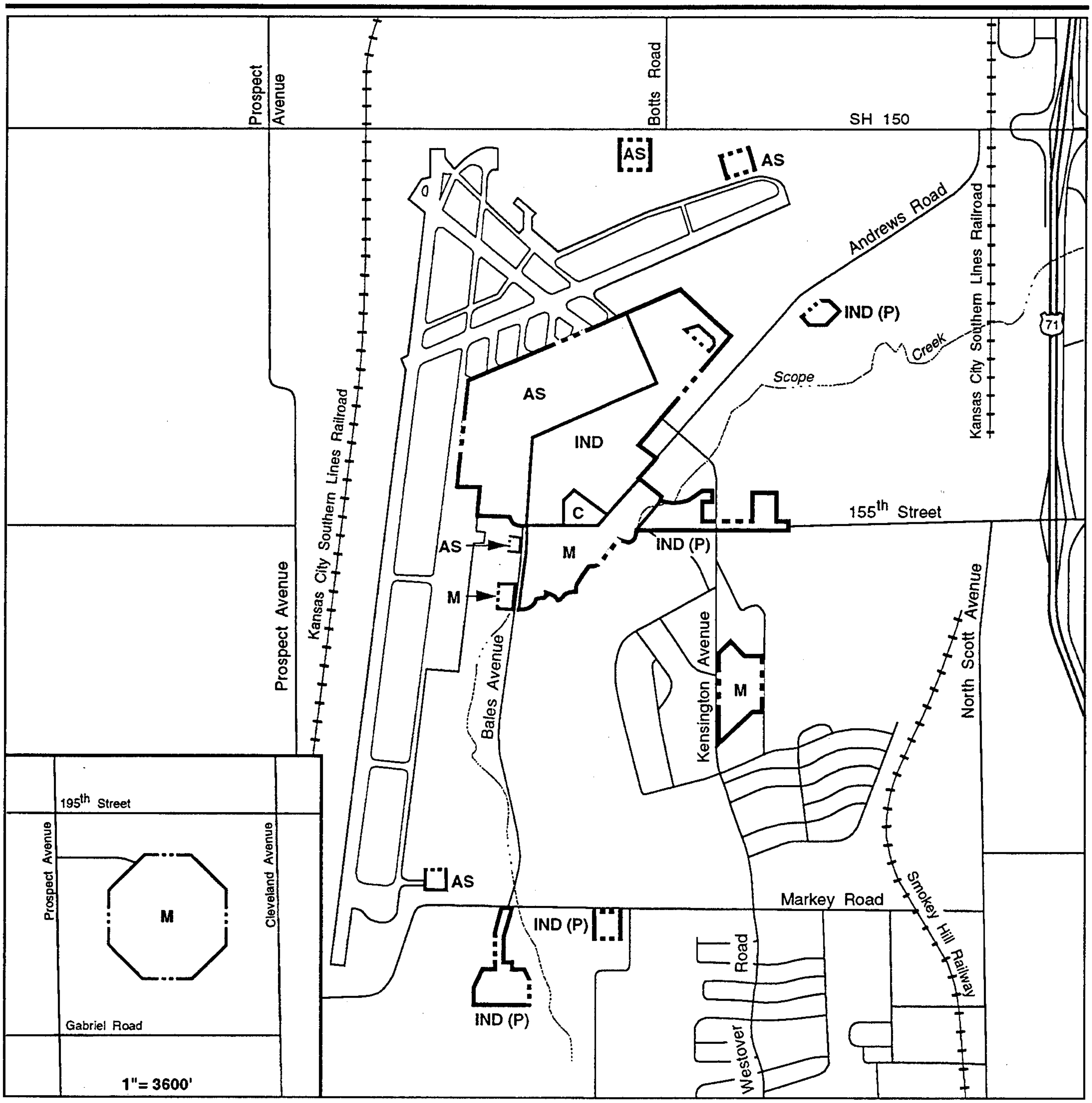
Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	0.00	0.17	0.00	0.00
Industrial	0.59	0.41	0.59	0.59
Office/industrial park	0.00			
Institutional (medical)	0.00	0.00	0.00	0.04
Institutional (educational)	0.00	0.00	0.00	0.00
Commercial	0.02	0.00	0.02	0.00
Residential	0.00	0.18	0.00	0.00
Public facilities/recreation	0.00	0.04	0.20	0.00
Military	0.20			
Agriculture	0.00	0.00	0.00	0.18
Total	0.81	0.80	0.81	0.81

P.A. = Proposed Action.
Alt. 1 = Aviation Alternative.
Alt. 2 = Aviation with Mixed Use Alternative.
Alt. 3 = Industrial Alternative.

Table L-16. Cultural Resource by Land Use Category, Richards-Gebaur AFB Reuse (number of sites)

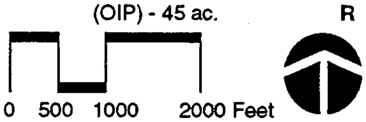
Land Use Category	P.A.	Alt. 1	Alt. 2	Alt. 3
Aviation support	0	0	0	0
Industrial	0	1	0	0
Office/industrial park	1			
Institutional (medical/educational)	NA	NA	0	1
Commercial	0	NA	0	0
Residential	NA	0	NA	0
Public facilities/recreation	NA	0	1	0
Military	0			
Agriculture	NA	NA	NA	0

P.A. = Proposed Action.
Alt. 1 = Aviation Alternative.
Alt. 2 = Aviation with Mixed Use Alternative.
Alt. 3 = Industrial Alternative.
NA = Not applicable.



EXPLANATION

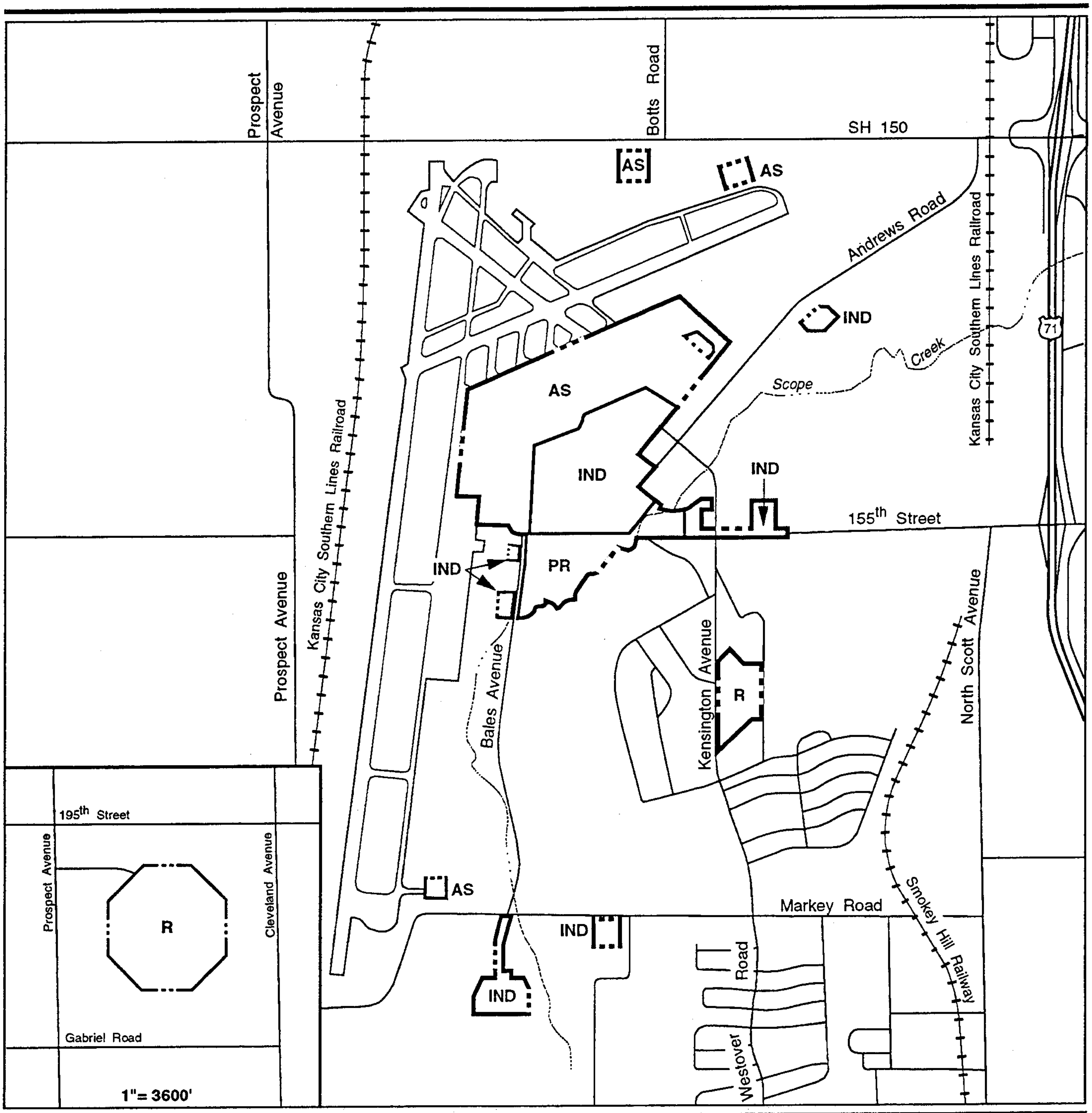
A	Airfield *	INT (M)	Institutional (Medical) *	PR	Public Facilities/ Recreation *
AS	Aviation Support - 88 ac.	INT (E)	Institutional (Educational) *	AG	Agriculture *
IND	Industrial - 57 ac.	C	Commercial - 5 ac.	M	Military - 231 ac.
IND (P)	Office/Industrial Park (OIP) - 45 ac.	R	Residential *	----	Base Boundary



* Standard land use designation not applicable to this figure.

Land Use Parcels - Proposed Action

Figure L-1



EXPLANATION

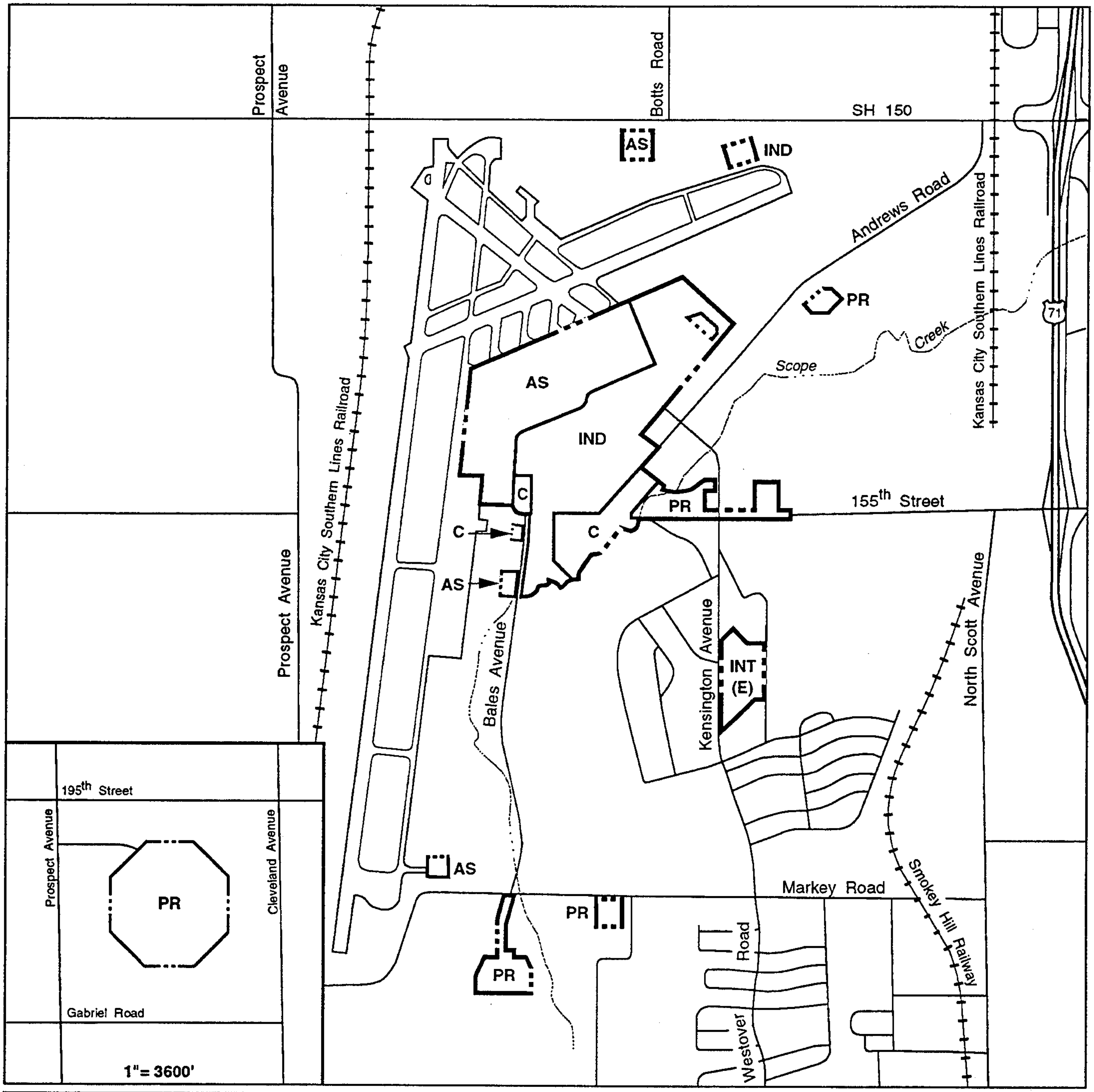
A	Airfield *	**INT (E)**	Institutional (Educational) *	**AG**	Agriculture *
AS	Aviation Support - 115 ac.	**C**	Commercial *	**VL**	Vacant Land *
IND	Industrial - 84 ac.	**R**	Residential - 197 ac.	----	Base Boundary
INT (M)	Institutional (Medical) *	**PR**	Public Facilities/ Recreation - 30 ac.		

0 500 1000 2000 Feet

* Standard land use designation not applicable to this figure.

Land Use Parcels - Aviation Alternative

Figure L-2



EXPLANATION

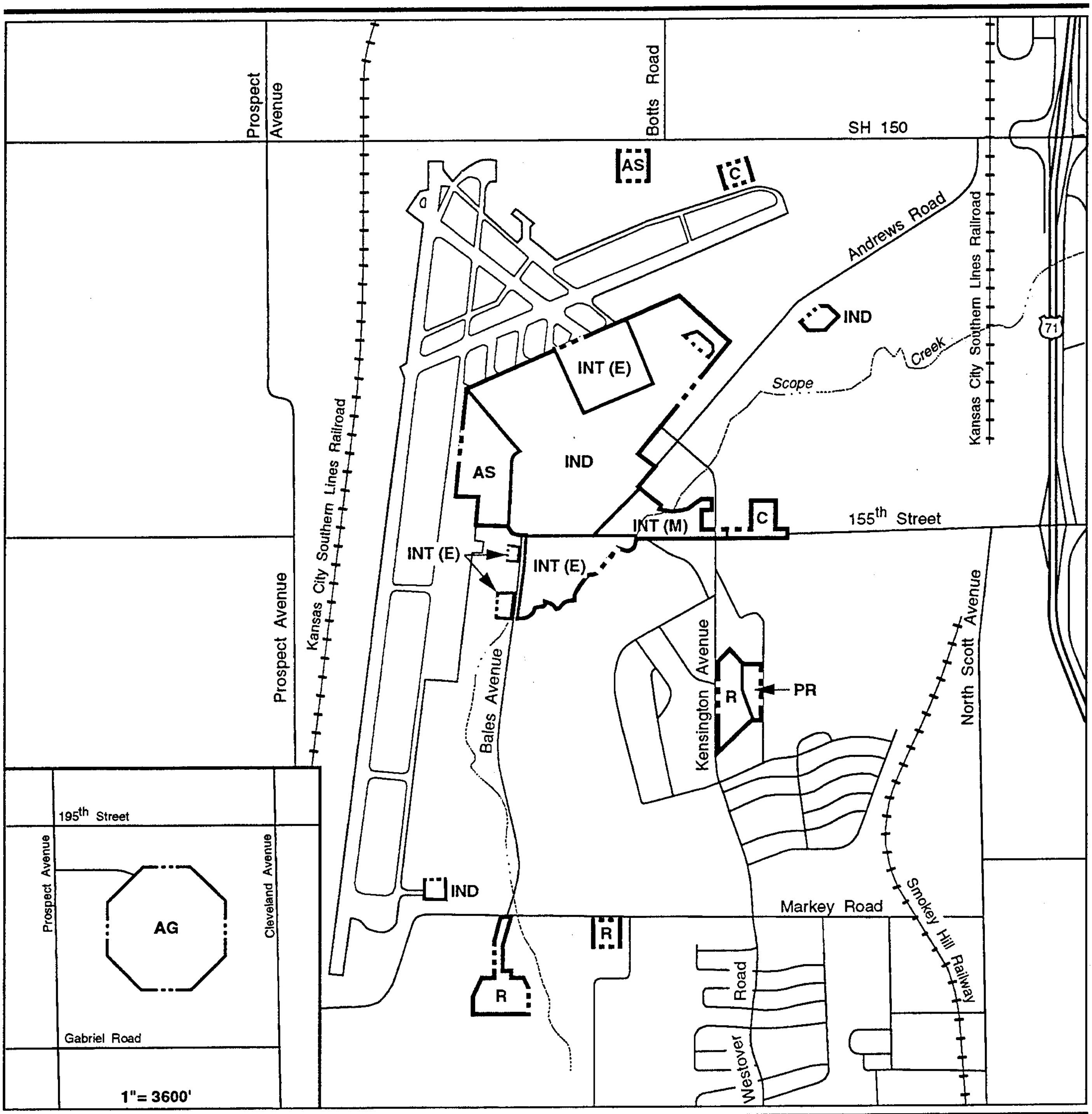
A	Airfield *	INT (E)	Institutional (Educational) - 13 ac.	AG	Agriculture *
AS	Aviation Support - 79 ac.	C	Commercial - 22 ac.	VL	Vacant Land *
IND	Industrial - 100 ac.	R	Residential *	----	Base Boundary
INT (M)	Institutional (Medical) *	PR	Public Facilities/ Recreation - 212 ac.		

0 500 1000 2000 Feet

* Standard land use designation not applicable to this figure.

Land Use Parcels - Aviation with Mixed Use Alternative

Figure L-3



EXPLANATION

A	Airfield *	INT (E)	Institutional (Educational) - 46 ac.	AG	Agriculture - 184 ac.
AS	Aviation Support - 25 ac.	C	Commercial - 6 ac.	VL	Vacant Land *
IND	Industrial -125 ac.	R	Residential - 19 ac.	----	Base Boundary
INT (M)	Institutional (Medical) - 16 ac.	PR	Public Facilities/ Recreation - 5 ac.		

0 500 1000 2000 Feet

* Standard land use designation not applicable to this figure.

Land Use Parcels - Industrial Alternative

Figure L-4